AMERICAN FORESTS

IF WAR COMES TO THE FORESTS

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AMERICAN FORESTS

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THE AMERICAN FORESTRY ASSOCIATION

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Washington, D. C.

The American Forestry Association is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute in the highest degree to the welfare of the nation and its people.

In addition to publication of two magazines — AMERICAN FORESTS and CONSERVATION, both designed to keep before the people of the country important conservation questions and issues, the Association carries on educational projects in various fields including forest fire prevention, reforestation, protection of fish and wildlife, upstream flood control, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, development of forestry by private endeavor, the teaching of conservation in the schools of the country, promotion of research in timber growing and use and expansion of markets for forest products.

The Association is independent. It has no connection with any federal or state governments. It is non-political and non-commercial. All its resources and income are devoted to the advancement of conservation. It has been so operated since its founding in 1875. All citizens interested in forestry and conservation are eligible for membership.

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CONTENTS

VOLUME 47 — September, 1941 — NUMBER 9

AMERICAN FORESTS

Page

402 "WHO'S WHO" AMONG THE AUTHORS

404 BIG TREES—OREGON'S DOUGLAS FIR MONARCH

405 THE EDITOR'S LOG

407 IF WAR COMES TO THE FORESTS
By John Clark Hunt

410 TREE ARTISTRY
By Paul Hidey

413 WANTED—A NEW CONCEPT OF FOREST PROTECTION
By H. B. Peirson

416 WILDERNESS TRAILS BY CANOE
By Shirley Allen

420 SERVANTS OF THE TREES
By Hugh M. Halliday

424 CANADA'S FIGHT FOR THE MUSK OXEN
By E. R. Yarham

426 THE TIMBER CRUISER GOES MODERN
By Theodore Kreuger

428 FORESTRY WITHOUT REGULATION
By A. B. Recknagel

430 TAMARACK—Larix Laricina (Tree Series)
By G. H. Collingwood

433 EDITORIAL
Fathers of the Wilderness

436 THE CONSERVATION CALENDAR

439 FIRES IN THE PACIFIC NORTHWEST
By John B. Woods

444 YOUR SHADE TREES—Some Popular Fallacies
By J. J. Levison

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Who's Who

Among the Authors in this Issue

John Clark Hunt

JOHN CLARK HUNT (*If War Comes to the Forests*), a Kentuckian and an ardent forest protectionist, has been in forestry and conservation work in the field for over ten years. He has written widely for newspapers and magazines, and his book—"South and West"—has recently come from the press of the House of Field, New York.

PAUL HIDEY (*Tree Artistry*) is a graduate of the University of Michigan in agricultural engineering. As an avocation he free lances, particularly in the field of art. He has a deep-rooted delight in nature subjects and a decided penchant for travel.

Henry B. Peirson

HENRY B. PEIRSON (*Wanted — A New Conception of Forest Protection*) writes of the forest insect enemy hordes with authority, for he is Maine's state entomologist, with headquarters at Augusta.

HUGH M. HALLIDAY (*Servants of the Trees*) is a Canadian naturalist whose boyhood home was on a wooded tract bordering Lake Ontario. Interesting swamps and fields nearby, in which arrowheads and other Indian relics were to be found, made of him early an eager field naturalist, and his first camera set the pattern for a life habit. As a result he has today a fine collection of several thousand first-quality natural history negatives, many exhibited photographs, and several international prize-winners.

A. B. Recknagel

A. B. RECKNAGEL (*Forestry Without Regulation*), Yale '06, M.F., educator and author, has been on the staff of Cornell University as professor of forest management and utilization since 1913.

G. H. COLLINGWOOD (*Tamarack*) is Forester for the National Lumber Manufacturers Association and JOHN B. WOODS (*Fires in the Pacific Northwest*), prominent forester, is Secretary-Manager of the Oregon Forest Fire Association and lives at Portland.

Shirley W. Allen

SHIRLEY W. ALLEN (*Wilderness Trails by Canoe*), forester, educator, writer, genial companion — is well known in his profession. An Ames man, he entered the U. S. Forest Service in 1909, in California. He later taught at the New York State College of Forestry at Syracuse and was on the staff of the Forest Products Laboratory during the World War. Coming to Washington as forester for The American Forestry Association, he did outstanding work in advancing the educational work of the Association and in national legislation from 1924 until 1928, when he left for Michigan to become professor of forestry at the University at Ann Arbor, where he is still located. Prof. Allen has traveled widely in this country and abroad and his book, "An Introduction to American Forestry," appeared in 1938. An enthusiastic Trail Rider, as many can testify, and lover of the woods—he returns from the trail to "play" with his own "sixty acres of Michigan woods and worn-out farm land."

E. R. YARHAM (*Canada's Fight for the Musk Oxen*) is a Fellow of the Royal Geographical Society of London and the British Empire Naturalists Association. His main interests are the conservation of wildlife and scenery and he has lectured and written for many years on these subjects.

J. J. Levison

J. J. LEVISON (*Some Popular Shade Tree Fallacies*) — a Yale forester, author and lecturer, has specialized in landscape forestry and tree culture. For ten years chief forester in charge of the parks in Brooklyn and New York, he now lives at Sea Cliff, on Long Island, writing and lecturing and engaging only in private consultation.

THEODORE KREUGER (*The Timber Cruiser Goes Modern*)—a Forest Service man since 1913 and formerly supervisor of the Black Hills National Forest in South Dakota, he has for the past two years been doing special work in timber management and development of methods adapting aerial surveys and photographs to timber surveys in the Central Rocky Mountain Region.

THE COVER—From a sketch by Devereux Butcher, illustrating the tragic *denouement*—"If War Comes to the Forests."

WAS IT LUCK?

WITH America's huge defense effort swinging into high, it is a fortunate thing for this country that the forests were ready for the emergency. Abundant timber is available for every need. In a single year, billions of feet of timber have been used in the construction of cantonments, shipways, workers' homes. And there's more where that came from.

If we had *not* had ample timber it would have been a national tragedy. But it wasn't luck that gave it to us. A generation of far-sighted conservation produced today's forests. Tree planting, fire prevention, good roads and controlled lumbering methods all did their part.

For years, "Caterpillar" Diesel Tractors have had an important share in forest work. They have built thousands of miles of roads and fire-breaks. And they have made it possible for loggers to practice selective cutting without injury to young growth.

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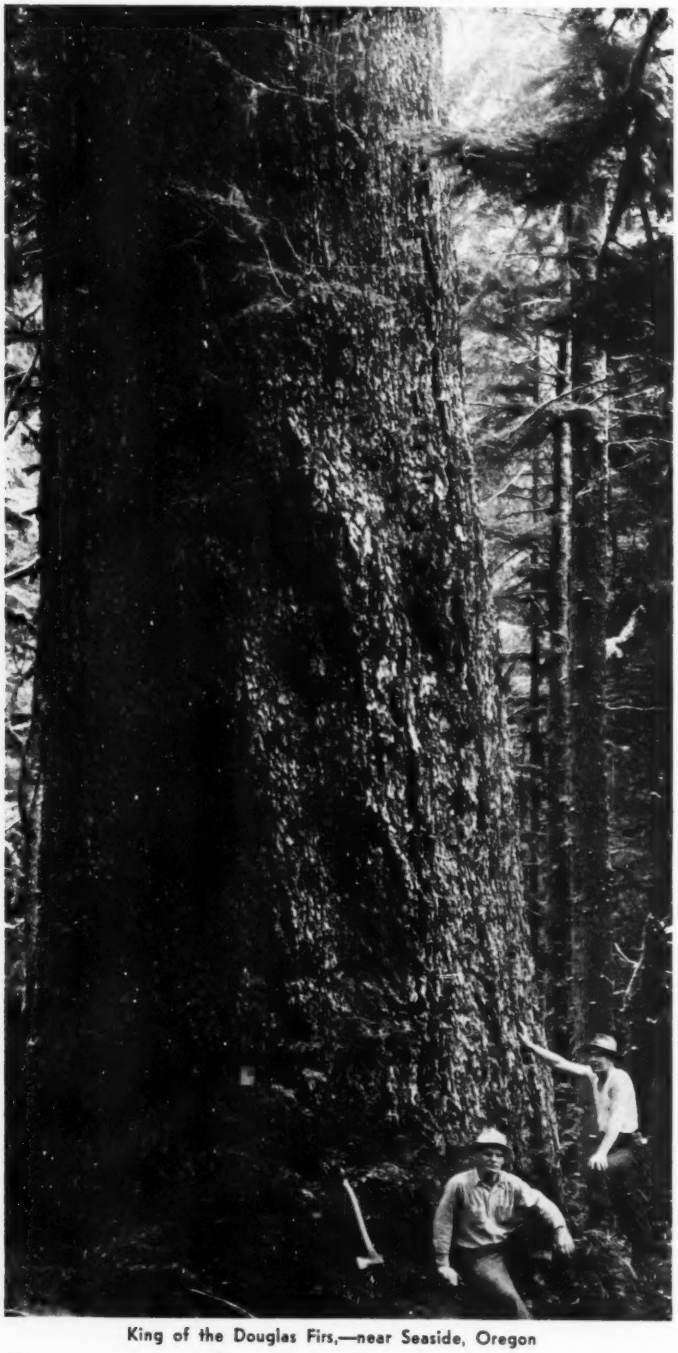
BIG TREES

OREGON'S DOUGLAS FIR MONARCH

The American Forestry Association is sponsoring a national hunt for the discovery and preservation of the largest specimens of the different species of typical American trees. Locate, measure and nominate your candidate in this competition. ACT NOW to make known and save the largest specimens of America's trees. For further details, send for the Association's special announcement of this Big Tree hunt. Mail your nomination with records and pictures to The American Forestry Association, 919 17th Street, Northwest, Washington, D. C.



King of the Douglas Firs,—near Seaside, Oregon

THIS magnificent tree has been nominated as the largest living specimen of Douglas fir by Les. D. Lloyd, Forester for the Hawley Pulp and Paper Company, of Oregon City. He discovered it on the lands of his company near Seaside. It is the largest tree of its species thus far reported and unless a successful contender can be brought forward, will stand as "King of the Douglas Firs."

Though difficult to secure accurate measurements of such a large tree, Mr. Lloyd and Leo Isaac (who made the photograph and who is attached to the Pacific Northwest Forest Experiment Station at Portland) made them in May and report its remarkable dimensions as follows:

> Rising clear of limbs for 108 feet, the trunk at breast height is fifteen and one-half feet in diameter; its circumference forty-nine feet, and height—to its broken but still live top, 210 feet.

It is good to know that the owners are protecting it, in the hope that the state or some public agency will take it over, with sufficient surrounding acreage to create a small park. They assure that, though logging operations have begun on the tract, they are to be conducted on a selective basis, following sound forestry principles and no trees will be felled within a large radius of this monarch of the Douglas firs.

"IF WAR COMES TO THE FOREST," by John Clark Hunt—lead article in this issue—is a timely exposition and warning of the vulnerability of certain sections of the country to sabotage through the use of forest fires. In publishing the article, the editor is mindful that it may be criticized by some readers on the grounds that the author has indulged in exaggeration or that the possibilities of sabotage through the setting of forest fires had better be left unmentioned.

Mr. Hunt is himself a forest protectionist. He knows, as do others who have witnessed forest fires, the destructive force of holocausts once out of control loosed by climatic meetings of drought and wind. The editor chanced to be in western Montana at the time of the historic 1910 fires when virtually the whole inland empire was laid prostrate for days. It would be difficult to exaggerate some of the wild scenes of that catastrophe. The record of those and other great fires that have occurred elsewhere in the country are the best answers to uninformed reaction that Mr. Hunt has overstated his subject.

As for maintaining a policy of silence in respect to the sabotage possibilities inherent in forest fires, the editor holds that danger cannot be successfully met by hiding it any more than can crime and disease. Furthermore, it would seem puerile to believe that enemies within and without the country do not already know of these possibilities and are probably well versed in methods of making use of them. The best protection against forest fire saboteurs is public awareness of their danger, public alertness to forestall their acts and public preparedness to deal with their fires wherever "planted" promptly and surely. Any other policy would be deserving of public condemnation and, once a great sabotage fire occurred, such condemnation would be swift in coming.

* * * * *

Extension of the one year military service under the Selective Service Act is on the verge of being voted up or down by Congress as this is written. If extended service is voted, it would appear that the Civilian Conservation Corps at long last could be marshaled to national defense in a highly contributory and useful way. Records of the Surgeon General's office show that of the men being called and examined for service forty per cent are disqualified by physical defects. These defects in the case of many men are often readily remedied through outdoor exercise, work, better nutrition and regular hours of living. A few months of rehabilitation as part of an extended draft service would still leave time for military training in an army camp.

The CCC has the camps for such physical build-ups. It has the organization and supervisory staff on the ground and prepared for the job by eight years of experience. It has the programs of work, exercise, and nutrition. It can take men for physical build-up tomorrow, next year, whenever or wherever assigned and at small cost. Is there any sound reason, fiscal or otherwise, why the Corps should not be so employed?

* * * * *

As previously noted in this magazine the planting of trees in the prairie states as carried forward under the government's shelterbelt project has within the space of eight years proven to be one of the notable examples of forestation to be found in America. Among the many services which these belts of trees already are beginning to render the prairie farmer, one not heretofore mentioned, was recently revealed by a forester after inspecting some of the plantings in Kansas. Farmer P. W. Seidel, Route 2, McPherson, told him of a fire that broke out last year in a field just as thrashing was completed and, whipped by a high wind, raced toward an adjoining field of wheat ready for harvesting. The onward sweep of the fire was stopped by an intervening shelterbelt of trees. Thousands of dollars' worth of ripe wheat was thereby saved. And only the first shelterbelt row of osage orange trees was damaged.

Ovid Butler

Editor.

Faced with possibilities of war national interest demands eternal vigilance and organized preparedness against the firing of forests and consequent prostration of vital defense sections of the country. The key to successful fire suppression is quick discovery, speed of attack and trained fire fighters. Here is a Forest Service lookout with a "smoke chaser," alert, packed and ready to go at the first sign of smoke. More of them are needed

IF WAR COMES TO THE FORESTS

By JOHN CLARK HUNT

WE ARE a nation preparing for the worst while praying for the best. We are faced with a new brand of war, total war, which could destroy all that we have built in three hundred years.

This war has two methods—the paralyzing frontal attack and the insidious undermining. It strikes from without and from within at everything a nation possesses.

The only defense is total defense. Nothing that can add strength must be overlooked and nothing that exists as a weakness can be allowed to continue as a threat to our preparedness. To recognize each factor and unit of defense and plan so that each will fit into the whole, then execute the plan, is a herculean task. Before it is finished it will require the cooperative work and thoughtful support, not only of the men and women who have been given defense jobs to do, but of every American who is capable of work and thought.

There are two constant dangers to the building of our total defense. The first and most important is time. The weeks and months and, in the case of the two ocean navy, the years in which to build. Precious time. Never before has time been so important to us.

The second danger is confusion. The mistakes which may be made in the rush. The division of opinion. The harangues and indecision which might waste this precious time. And in this rush and confusion some vital unit may be overlooked and go undefended.

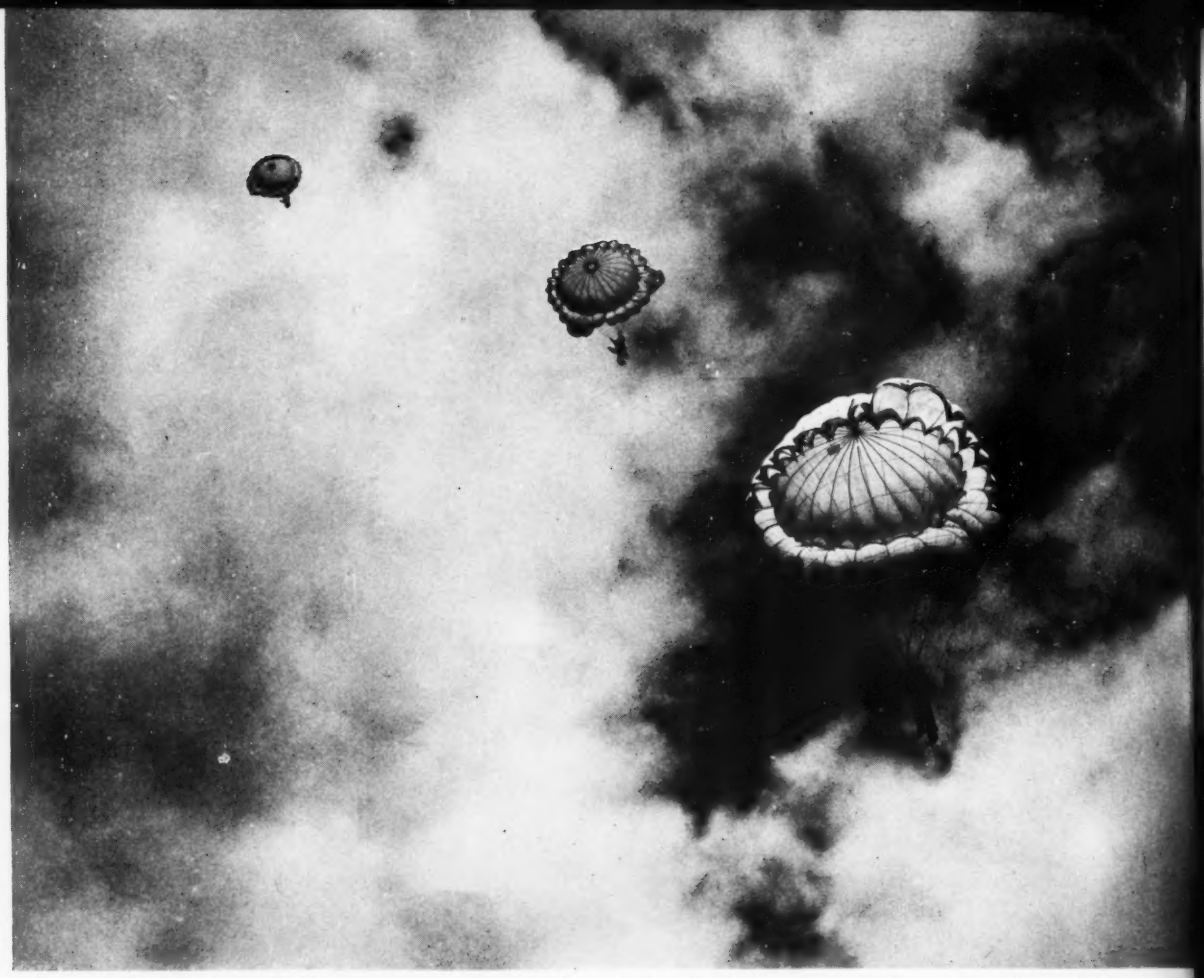
I have one of these units in mind. Take a map of the Pacific Coast which shows the area of forests and watershed lands. In time of peace these forests and watershed lands are a protection to all the rest of the land area of the Pacific Slope. This watershed cover stretches, with only minor breaks, from Mexico to Canada and holds or controls most of the vital resources in the region—water, soil, timber, grazing, mining, irrigation, water power, flood control, erosion control, and recreation. Herein lie the resources for economic blessings and herein also lie the potential destruction, not only of those resources, but of most of the economic life of the Pacific Slope.

Under ordinary climatic conditions and ordinary circumstances the forest and watershed fires can be controlled. But in case of war with powerful, well informed enemies, both within and beyond our borders, coordinating their efforts and striking when conditions are at their worst, the results could be a terrible destruction. The forests and watersheds might become roaring infernos followed, in a few months, by floods that would complete the desolation.

This is not meant to be the description of a nightmare. It is, instead, a logical possibility of what CAN happen —proven by numerous small examples of what HAS happened in times of peace.

Perhaps efficient plans have been made to defend these resources. Perhaps these plans will soon start to operate to make this defense effective in any eventuality. But

In time of peace these forests and watershed lands are a protection to all the rest of the land area of the Pacific Slope. In time of war, unless adequately guarded, they may be the means by which most of the economic life of that great region could be destroyed



Every effective weapon of defense against forest fires started by saboteurs, lightning or human carelessness should be developed. Here the Forest Service is developing and training parachute fire fighters—one means of quick attack in remote country

time is precious, and organizing, training and the procurement of facilities take time. Immediate action is paramount.

Under the direction of Brigadier General J. O. Donovan, Adjutant General of the State of California, a State Guard is now being formed and auxiliary defense plans for the state are being formulated. Action has already begun in some phases of what will be its protective work.

Faced with the possibility of war, mutual interest in the defense of our natural resources should call for the close cooperation of the following organizations and add greatly to our total defense: the State Guard, the United States Forest Service, the State and County Forest Services, the Civilian Conservation Corps, and the United States Park Service.

But each of these conservation organizations were created, trained and equipped for the management, utilization and protection of the forests and watersheds and other resources during peace time, and to meet normal emergencies. WAR could increase the task of these organizations out of all proportion to their abilities to cope with it. Strength must be built to meet WAR EMERGENCIES.

How, for example, would the enemy strike the forests in a region which includes all of California and western Nevada? There are probably two methods, or a combination of the two. The first method is sabotage. The saboteurs might be foreign fifth columnists or American born or naturalized axis sympathizers, and they could, if our internal defenses are not strongly prepared, destroy millions of dollars worth of property.

The second method would require the use of enemy aircraft. A fleet of large bombing planes would not, however be necessary. Ten fast fighting planes, flying high, could set fire to the forests of California, Oregon and Washington in thousands of places. They could fly high because the target is long and wide.

The eighteen national forests of California cover more than 19,000,000 acres. The state forest and watershed lands cover a much larger area. It would be hard to miss such a target. The planes would be small because even a small plane could carry hundreds of the small fire-starting chemical pills.

But just how serious could be an attack by the fire-sowing planes from the outside and the work of the "fire bugs" from the inside?

If the fire fighting forces were strong enough, properly distributed, well trained and equipped, and the climatic conditions were not too desperate, the fires could be controlled before they did any great damage. The key to successful fire suppression is speed of attack and trained fire men. I have known a dry lightning storm to set a hundred or more fires in some two million acres of bone dry, inaccessible forest land and the fires were controlled without the terrible loss of resources that one fire will sometimes leave in its wake. But several thousand fires at one attack at the peak of the season could mean ruin to the watershed and timber of a whole state.

When it sometimes takes thousands of fire fighters to stop one fire, try to picture thousands of fires being driven by a high wind. After they once hit their stride there are not enough men in our army and navy to control them.

The individual fires would quickly burn together and become one gigantic front of rolling, leaping flame. It would be a conflagration such as no man has ever seen. Each day the front would advance miles and no human power could stop it. Smoke would billow and rise and spread over an unbelievably large area. Ashes would fall hundreds of miles in advance of the flames. Visibility would be zero. Forest roads, main highways, and railroads would be closed by falling trees and boulders from the burned over mountain sides. Towns, mills, ranches, farms, resorts, power plants and power lines, telephone lines, livestock and wild life would be at the mercy of the fire.

Finally, of course, the fire would stop. It would burn itself out. The wind would lay. The humidity would go up. Thousands of weary fire fighters would still be working along its edges. The fire would be a smoldering, sprawling black and gray mantle covering mountain ranges and whole counties. The much needed timber and the employment it gives would be gone. The watershed would be ashes. All the other values that had not been quickly moved or protected from the flames would be lost. The huge ugly area would continue to smoke and smolder until the rains and snows of fall and winter came. Then the full realization of the tragedy would descend on the valleys and lowlands.

Ashes, top soil and burned drift wood would come on the tide of the first flood. Sand, gravel and boulders would follow. Stream and river channels would be filled. Dams, irrigation systems and power plants ruined. The flood waters would spread over the valleys depositing sand and gravel on productive farms and orchards. Towns, railroads and highways would be washed out or buried under debris and avalanches.

Now, what can be done to prevent enemy attacks from burning our forests and watershed lands? There are several things which can be done. Things which will add to our total defense.

Since enemy aircraft could cause the greatest destruction to the forests as well as Pacific Coast cities, aircraft plants, powder factories, air fields, army camps, oil fields and other vital targets, prevention of enemy planes from acquiring air bases within feasible striking distance of our shores would remove (*Continuing on page* 434)

Try to picture thousands of forest fires driven by high winds and becoming one gigantic front of rolling, leaping flame. All the men in our Army and Navy could not stop them. National alertness to prevent them from starting is the surest defense

TREE ARTISTRY

Ronald Locke
Etcher of Trees

By PAUL HIDEY

Etchings shown by courtesy of The Associated American Artists of New York

RONALD LOCKE knows his trees. He knows them all and he knows all about them. He knows their foliage, their bark, their seasons and their locales. He knows the trees of the far sunny south in the balmy fragrance of a hot tropical climate, and he knows the trees of the great Northwest, of the New England states and how they appear in that clear sharp coldness of the north. And all this knowledge is being recorded by a talented artist through the medium of acid-bitten copper plates into exquisite etchings. The day will come, Mr. Locke believes, when he will have etched every variety of contemporary tree as a permanent record for all posterity.

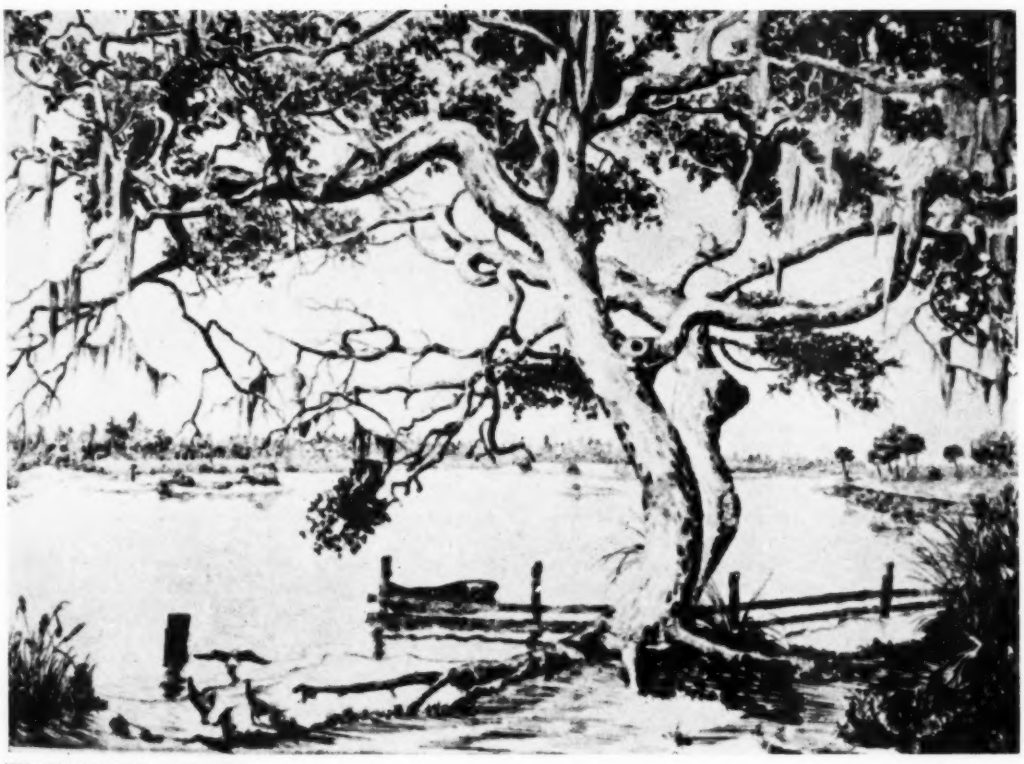
"My favorite tree?" he chuckled, "Why, that's a funny question. It's like asking a parent which is his favorite child. I love them all. I have wandered through miles and miles of forests, and I'm interested in all those trees —every one of them. You see," he went on in his own peculiar accent garnered from his various habitants, "as a woodsman these trees are known to me not only for their usefulness in protecting the hill sides and stopping floods, but also the rock maple for its sap, the hemlock for both lumber and tanning, the spruce and pine for lumber, the beech and birch for turning stock, and so forth. Now, having cut and dragged many, many of these trees to the mill where we will assume they have fulfilled their destiny, I think it is a sort of poetic justice that I try to reproduce them faithfully on copper."

It was during a period when Ronald Locke was far from well, while living in a tent as a sort of panacea for all ills, that he first met the great etcher, Alfred Hutty. And it was under his sympathetic teaching that Locke again resumed an art study that had been abruptly terminated some twenty-two years before. To consci-

"GLORIOUS EUCALYPTUS"
An inspired treatment of a Southern tree group, combining interesting local color

"END OF SUGARING"

Study of the rugged trunks of old maples in a New England "sugar camp"



"PEACE ON THE AMELOTE"

An old live oak,—moss-hung, on the banks of a sluggish Florida stream

entious work under Hutty was added the tutelage of Louis Kronberg, and soon the exciting realization that it was not too late to start again along the road of self-expression was followed with the evidences of an ever-increasing ability. Today his inspired work has a technical competence. His exquisite portrayal of trees has brought him national recognition, and he now belongs to the Associated American Artists, who distribute original etchings and lithographs by the nation's most celebrated artists to either John Doe or The Metropolitan Museum of Art at equally reasonable rates.

The artist spends his summers in the hills of the New England states. He winters in a terrace home on the picturesque Anclote River in Florida near Tarpon Springs where he lives peacefully under the twining pine and moss-hung oaks among the homes of fishermen in a sanctuary of birds. But wherever he happens to be living, Locke is always patiently working away at his art. He puts months of study on a single subject. Finally, with an incredible amount of detail made up of tiny lines, he produces a conception of pleasing composition and simplicity.

Ronald Locke is a strapping sportsman of six feet two inches in height with a hankering for fishing rod or rifle. He can not tolerate urban life, and once spent twelve years off by himself in the great Northwest woods. A most resourceful individual, he builds his own furniture, fitting everything together with the sincere conviction that this too is a personal expression. A life-long penchant for the wilds has made him the naturalist that he is. His hobby is fishing, with a special flair for dry fly fishing.

Locke claims he has had no exciting experiences in his life, but admits that he has shot alligators in the Everglades; that he was once yanked about fifteen feet by a wounded buck; that he was nearly gored to death by a wild cow in the Florida hinterland and was obliged to shoot the animal with his Colt automatic which he happened to have in his pocket; that a stamping and roaring bull moose only ceased charging at him when less than twenty feet away before crashing off into the woods; that he once tipped over in a canoe in Nova Scotia and after rescuing his companion spent the next four days diving for his shot gun.

Trees may or may not have played an important part in these adventures, but they figure more prominently in the most exciting of all his experiences. It was a tree that saved his life when with a companion he was shooting down the Aroostook River during spring flood in a frail canvas canoe. Madly they paddled to pick a channel through the rapids,—breath-taking seconds of frantic work to avoid rocks in their (*Continued on page* 447)

"CONTENTMENT"

The etching of this magnificent old tree exemplifies the unusual skill of the artist

WANTED -- A NEW CONCEPT OF FOREST PROTECTION

Tree Destroying Insects and Disease, More Deadly Than Fire, Present Challenge to Protection Forces

By H. B. PEIRSON

What one small insect enemy can do to a great forest—Lodgepole pine in the Yosemite National Park killed by the Western bark beetle, *Dendroctonus monticolæ*

WHEN we hear the phrase "forest protection," most of us think of fire protection. Few realize that other destructive forest agents take an even greater toll than fire. I have often wished that some artist would draw and place before the public a sketch of a forester fighting a stubborn blaze while behind him, all unheeded, are hordes of insects weakening, killing, and destroying mature stands of timber on which taxes have been paid for from sixty to a hundred years. It would not be a pretty picture, but it would be a true one, a portrayal of what is taking place today in many sections of the country.

With our forest resources becoming increasingly valuable for wood and cellulose products, water storage, soil retention and recreation, our concept of forest protection and conservation is still too limited. True, due to the awakening of public opinion, great forest fires are no longer allowed to run unchecked and we have built up splendid systems of fire prevention, detection and control. This, however, is not enough. Man's interference with nature through the cutting and changing of what were relatively stable forest types and, to an even greater extent, the bringing in of exotic forest insects through ever increasing avenues of commerce, has so changed our forest picture that new concepts of protection are necessary.

Today, fire is probably no longer the forest's greatest enemy. Reliable statistics indicate that the average annual loss from forest insect pests is several times that from fire. In New England alone it is approximately $5,000,000 a year. This loss is in the actual killing of forest trees over large areas, in their weakening and consequent loss of increment, and in the destruction of forest products.

Figures for the United States reveal an annual damage to forests and forest products from insect attack in excess of $110,000,000. In some of our largest timber producing states recent surveys have shown that damage from insects is from ten to thirty times as great as that from fire. Tree diseases take an additional heavy toll.

Within the history of the Northeast, insect epidemics have repeatedly destroyed vast quantities of timber with practically no concerted effort made to prevent

these losses until the present day. We have seen the larch almost annihilated by the larch sawfly. At the present time beech is being attacked by the beech scale and a nectria disease which follows, and indications are that this magnificent tree will be almost entirely wiped out of the Northeast. During the period between 1910 and 1920, thirty per cent of the spruce and seventy per cent of the merchantable balsam fir was killed in Maine by the spruce bud worm. We have seen our white oak destroyed by the gypsy moth. Today, with the European spruce sawfly present throughout the Northeast, we are faced with one of the most serious forest insect outbreaks ever to invade our forests. In the West bark beetles have killed billions of feet of pine.

This is not the picture of an alarmist or propagandist, for the forest entomologists have always leaned heavily to the conservative side. It is simply a statement of facts known to anyone who will take the time to read the warnings of the entomologists. The question is—shall we wait until our forests are destroyed and our dependent industries closed before we take any concerted effort to save what is left? We must have our highly specialized sales forces, our research chemists, and our modern factories; but behind all of these, there must be healthy forests supplying the raw material without which these industries cannot survive.

The question naturally arises as to what can be done to meet the insect problem. Today there are many avenues of attack and many examples of success to give us courage in our efforts. These phases of control will be dealt with lightly in this article, for we are primarily concerned with organizing to prevent invasions, and if outbreaks do occur, to stamp them out before they become widespread. There are examples of how insect damage may be prevented by proper forest management; and the interesting thing about them is that they illustrate the most economical ways of managing a forest. Many of our severe bark beetle outbreaks could be prevented by concentrating cutting on old, weakened stands, and by selective cutting of weakened trees. Most of our heavy losses in birch, poplar and maple from borer injury can be prevented by forms of management which do not open up the stands. Methods of planting have been worked out by the entomologists to lessen the danger from certain types of insect attack.

Here fine second-growth spruce has been badly defoliated by an enemy from Europe—the spruce sawfly

"How are the mighty fallen"—A great spruce forest after attack by the spruce bud worm

One of the most fascinating and promising means of control is through the use of introduced parasites. In their native habitat most insect pests are held in check by what is known as a natural balance—one insect preying on another. The introduction of a foreign insect pest leaves this insect free to increase, for its natural enemies usually are not present. It is then that importation of its parasites from its native habitat and the rearing of them in large numbers for distribution is often of great value. During the past few years the Canadian government, several of the New England states, and New York have been raising parasites to combat the European spruce sawfly. The State of Maine, at the Augusta laboratory, has reared and distributed over 200,000,000 of one species of parasite alone. Promising results are already being obtained. Airplane dusting and the maintenance of mixed forest stands are other means of control.

But there is need of a more definite plan of attacking our forest insect problems. This plan should be national in scope with the states taking an active part, working not as individual units but cooperating with each other and with the federal government. To bring this about, the concept of forest protection must, first of all, be widened to include all destructive agencies whether fire, insects, or disease and all forest species. An unmerchantable species today may be of utmost value a few years hence. Balsam fir and some of our hardwoods which today are in great demand were considered of little value only a few years ago. Tomorrow, trees such as larch, beech,

maple, and yellow birch may be of primary importance as sources of raw wood. Furthermore, it is usually good management to maintain natural mixed forests.

Secondly, leaders are needed who have a broad conception of forest protection and adequate training in forestry and its related sciences. In the past, many of our forest schools have failed to provide sufficient instruction in forest entomology and forest pathology, although this fault is gradually being corrected. Such courses should be required of all foresters who practice in the field or who supervise control over woodlands. These courses should be given by men who have had field experience. With a trained personnel in the field, other phases of the problem can more easily be solved.

A counter attack gets under way, as Maine plans to protect her forests by launching a state Forest Service plane, loaded with parasites to be distributed in her spruce forests

In organizing for insect and disease protection there must be a central agency which will take an active lead in planning the work on a national basis. This leadership should be in the Bureau of Entomology and Plant Quarantine and the Bureau of Plant Industry, United States Department of Agriculture. It is suggested that regional committees made up of foresters, entomologists and pathologists be formed, which can serve in advisory capacities. Such a committee has recently been formed in the Northeast with representatives from each of the New England states, New York and Canada. The committee is doing much to solidify control efforts among the states in this section. Pressure groups are usually interested in but one specific project, whereas regional committees could be counted on to weigh all phases of the protection problem in their sections, and to help formulate a national protection policy. They also would be in a splendid position to collect and disseminate information in regard to outbreaks and methods of control. One of the objects of the Northeastern Forest Insect and Disease Control Committee has been to plan control work so as to avoid duplication of efforts and to prevent ineffective measures.

With an active central organization supported by regional advisory committees, the next step would be to strengthen field detection forces. The present separation of entomological forces from the forest protection forces has been a handicap. It would be a decided mistake to place all forest entomological work under forestry, for one is just as much of a science as the other. It does seem essential, however, that each agency dealing with forest protection, whether it be federal or state, should have entomological representatives in its personnel. Such a system is in effect in Maine, New York, and the Province of Quebec, Canada. As time goes on pathologists should be added.

It would seem particularly desirable for the United States Forest Service to take active leadership along this line on the national forests, and in their cooperative protective work with the states, just as they have in fire protection. This might be brought about by an amendment to the Clarke-McNary Act.

The duties of these entomologists would be to answer inquiries, instigate and take charge of control measures, and instruct forest fire wardens on how to detect incipient forest insect outbreaks. Wardens with these broader duties of protection should be called "forest wardens," dropping the limiting term "fire."

Our forests today are carefully patrolled by a class of men who, if properly trained, could with almost no added expense

(*Continued on page* 446)

Part of the insect control work consists of the introduction from their native habitat of parasites which prey upon the pests. This warden is placing a parasite cage in the woods

WILDERNESS TRAILS BY CANOE

By SHIRLEY W. ALLEN

Photographs by Emma Rutherford and S. B. Wortis

For the first time, Trail Riders of the Wilderness, sponsored by The American Forestry Association, had the opportunity this year to choose between saddles and canoes as a means of exploring wilderness country. For several years the Association has considered the idea of offering to a limited group a canoe trip into the lake wilderness of the Superior National Forest in northern Minnesota. This summer the trip became a reality, and on July 10 a party of fifteen, including guides and camp crews, left Ely, Minnesota, with canoes and spent thirteen days following water trails in a vast lake wilderness that has no equal elsewhere in the country. The trip was arranged in cooperation with the U. S. Forest Service and formed one of eleven wilderness trips offered by the Association in 1941. In this article, Shirley W. Allen, who was the Association's representative, reports on the success of this first wilderness trip by canoe.—Editor.

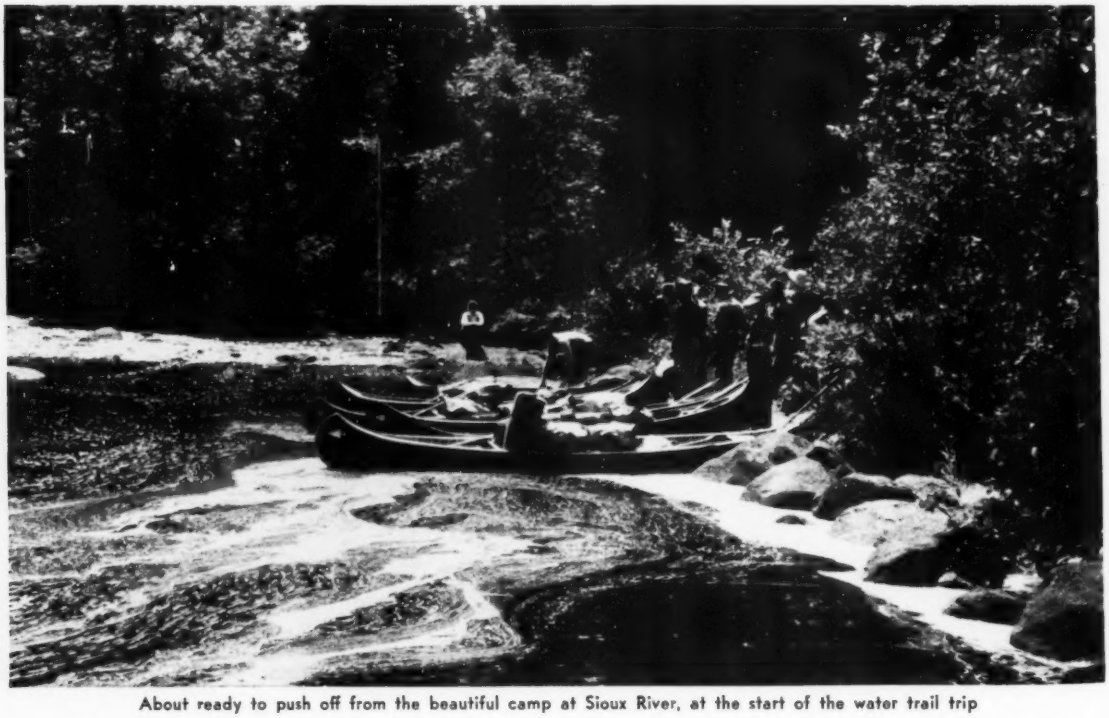
TO SOME of us it was return after many years to wilderness country we had known and loved; to some a first visit, and to all a completely new kind of organized trail riding — more strenuous than the usual mountain horseback trip but by the same token, more adventurous.

Leaving Ely the morning of July 10, a forty-mile drive northwest over the narrow but scenic Echo Trail —better known to old-timers as the Ely-Buyck road— landed us at a beautiful camp on the dark and marshy Sioux River. The guides had coffee on the fire and from then on, the two Johnny's, Pat, Bobby, Andy, Donald, and Big Dave, three of them having gone on ahead with supplies, were eventually to show us everything from blueberry pancakes to the four different ways to steak a wall-eye pike,—so plentiful in these northern lakes.

The traditional noiselessness of canoe travel didn't prevail at the start but as the six crews settled to the rhythm of the paddles on their journey north, an occasional porcupine paused along the shore to size up the invaders, the gray jays scolded loudly and once just ahead of us among the lily pads and wild rice, two deer watched us a moment before bounding into the woods.

Our guides had a surprise at the first portage. We had "hired out as tough men" and were there to demonstrate it. There was lots of help from the Trail Riders even though a few backs were to feel that there are plenty of tricks about swinging a canoe up onto the shoulders and adjusting the weight of a heavily loaded Duluth pack sack on portage.

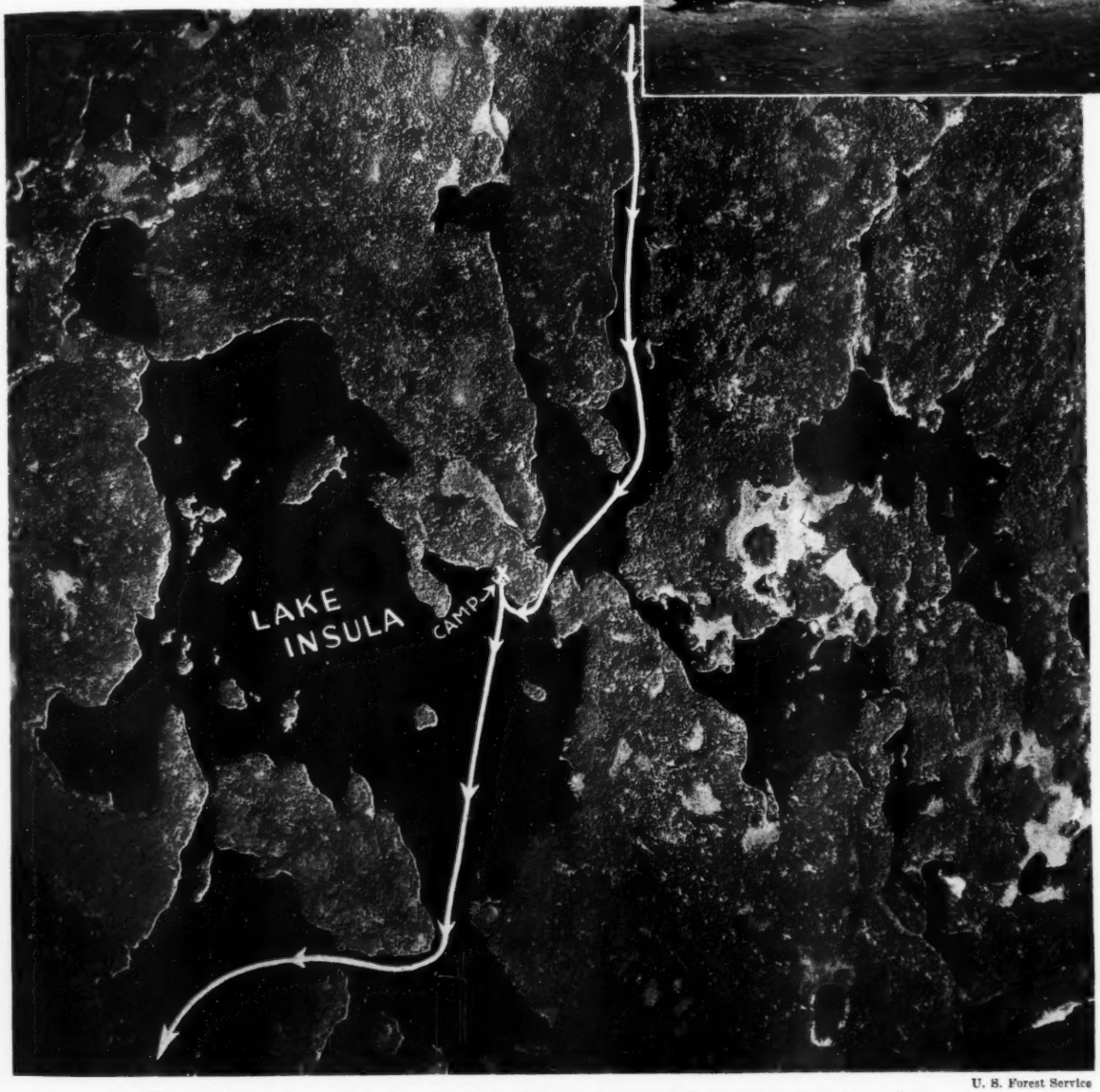
River to river to lake to lake to camp in three portages



About ready to push off from the beautiful camp at Sioux River, at the start of the water trail trip

brought us to an open grassy hill below Sioux Lookout with the tumbling rocky Devil's Cascade rushing its waters toward Loon Lake on one side of us, and scattering aspen, paper birch, and balsam in friendly, breezy conversation all around. There was time for blueberry picking and a refreshing swim before supper. And what a supper! No Trail Rider group ever gave a more expert demonstration of how to make food disappear.

Long northern summer evenings allow time for fishing—perhaps an hour or two before it is dark enough for campfire. And in the Superior Wilderness, camp is always near good fishing waters. Two wall-eyes and a sizable great northern pike—the latter contemptuously referred to as "snakes" or "shovel-nose-trout" by our guides—comprised the take for this first evening. The forest guard and his wife joined us for campfire, coming over from their nearby log cabin. The mosquitoes sampled our various dopes and left us encouraged. Black flies had apparently given up for the season. The flow of song and story rose above the crackle of our fire and finally as taps—"Day is Done"—floated out over the lake, we had tasted our first day of the northern wilderness and had found it good.



U. S. Forest Service

This aerial map of part of the Superior National Forest shows part of the route, where three glorious days were spent near the end of the trip—paddling from lovely Lake Insula to Lake One—on the way out

Pushing into Loon Lake the second morning we reached Beatty Railroad Portage into Lac la Croix by

noon. Of course we scorned the crude railroad with its pulleys and cables operated by an old automobile engine. Perhaps this was a concession to the *Voyaguers,* some of whom must have turned over in their graves as we loaded supplies and duffel into two launches after lunch for the first lap of our journey over the fur traders' canoe route from Rainey Lake to great, cold Lake Superior. Light loads and one guide to each canoe were assigned and three to five canoes towed in tandem behind each launch. Towing halters were lashed about the bow of each canoe and off we started—faster but not unlike a mountain pack-string with which many of us were more familiar.

Before us lay thirty-mile-long Lac la Croix between Canada and the United States, studded with more than two hundred green islands and with countless bays and peninsulas bordering its rocky, wooded shoreline. It would have been a long paddle indeed to Lady Boot Bay where we camped for the night and for a day of rest and exploration. There was some momentary alarm when we saw no cook nor sign of a camp upon arrival, but in a country of a dozen bays and points to the mile of shoreline, it takes a little longer for two ends of a party to join. Around the bend they came and our first fish supper was soon sizzling. To anyone familiar with the border lakes, a guide's contempt for great northern pike as a fish to fry is proverbial. But there were nineteen of us counting all hands and we had picked up the district ranger at the last portage. So we couldn't all have boneless steaks from the walleyes and it's not nearly so much fun to catch them. This in spite of the fact that all the fish we met wanted to "rassle" and only submitted when stunned as they were picked up by the eyes! And it was at Lady Boot camp that we started on blueberry pancakes and that the propaganda in favor of blueberry short cake began rapidly to build up.

Indian paintings in the mysterious red pigments were to be seen next day on a cliff not far from Lady Boot on Lac la Croix. Prints of human hands, moose, chiefs in conference over a table are left by these inspired primitive artists. Nearby too was a Canadian ranger station where we looked over the fire-fighting equipment, had a drink of cold spring water,—a real luxury in that section,—and were shown the very neat quarters where the friendly ranger assured us that scrubbing was the order "once a month whether needed or not."

News of the presence of a doctor in the wilderness spreads rapidly by "grapevine," and our medical officer found himself ministering to a recluse suffering from slow healing of a last winter's amputation of frozen toes. He was also called upon to remove a fishhook from an ear of a fisherman in a neighboring party.

A long paddle from Lady Boot to Boulder Bay took us through narrows and produced excellent trolling. An occasional "five"—as short rest stops are known—gave ample chance for change of stations and paddling experience both in stern and bow and even lunch was an adventure each day. Boulder Bay camp witnessed a lot of laundering and swimming, and fish suppers were becoming a habit.

Portaging as well as travel on the fourth day was full of variety. The portage from Lac la Croix to Bottle Lake presented some difficulty because of fallen timber, but we were able to make it into Iron Lake by a "lift-over" and noon found us beside lovely, dashing Rebecca Falls where the brown waters of Iron Lake part around a small island as they tumble into McAree. Continuing our journey we made the tough 160-rod portage into Crooked Lake, paddling north along the west shore for a look at Curtain Falls. This inspiring view of the roaring waters as they rush from Crooked into Iron Lake should be seen from the south or west. From the north the view is marred by a resort, recently established on private land which the federal government did not succeed in acquiring. This resort and one other on Crooked Lake are served by hydroplane and stand as a serious threat to the wilderness character of the entire area. Visitors seeking primitive and unspoiled scenes in the border lakes country are invariably shocked at this development as they are by day fishing parties brought in by airplane in the morning and called for in the evening. There may be propriety in protecting the area and in serving emergencies by airplane in a wilderness, but to resort to airplanes for sport in such an area is plain cheating.

We were to have camped at Curtain Falls, but were glad to paddle out a mile or two into Crooked Lake and take possession of "Trail Riders' Island" for the night. Welcomed by the Forest Guard and his wife who had come up from Crooked Lake Cabin in a launch to get things going for camp, we found the place so tiny a domain that tent poles and fire wood had to be imported. There was light rain in the night and the weird cry of the loon sounded a wilder note than ever. It was on "Trail Rider Island" that a number of women in the party decided to sleep out and even persisted to the extent of encountering plenty of wildlife in the persons of mosquitoes. Tents were complete protection from these tiny, pestiferous varmints.

The only real rain came on the next day's trip down Crooked Lake to Table Rock. Some of us recalled the old cowboy song:

"Oh it's cloudy in the west and it looks like rain
And my d--ned old slicker's in the wagon again!"

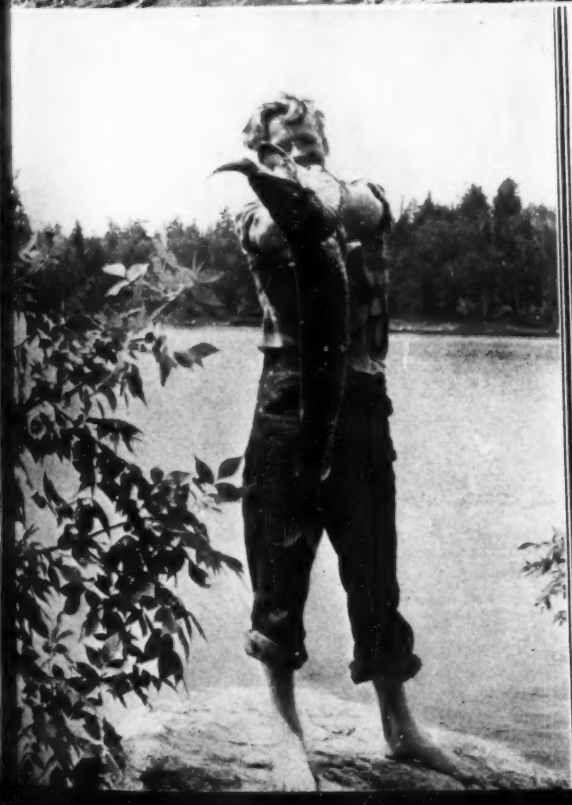
Most of our packs were in the launch that day and our faith in good weather was more beautiful than useful. But the sun came out warm after each shower.

Table Rock, our fifth camp, was on the Minnesota mainland, with good fishing. Blueberry cake appeared here, and we were interested in the massive rock slab from which the point takes its name. Raised about a foot from the rocky shore and supported by small boulders, this slab, a foot thick and about twenty feet square, is said to have been a conference table of the Sioux, who ranged over this locality as a battleground with the Chippewa. Conversation about campfire ran to the wilderness idea and progress on the establishment of the Quetico-Superior International Wilderness. Forest Service men were busy as usual answering questions about their work.

An easy paddle in the morning took us to Lower Basswood Falls, a foaming cataract which a recent photographer is said quaintly to have asked one of the rangers to shoot in a canoe so he could get a real action picture. Here we camped on the portage itself (it was the most comfortable if not the most polite place to camp). Fishing was good in the rapids below the falls. The Crooked Lake guard (*Continuing on page* 441)

Reading left to right —

The girls make a portage; on Lac la Croix,—the canoes behind the launch; the beautiful rushing waters of Rebecca Falls; on portage — Ruth carries her duffel and "Doc" swings along with his canoe; a master catch and, the canoes in formation on Lake One — at the end of the blue-water wilderness trail



Eight leaf consuming cankerworms are destroyed at one gulp by the young rose-breasted grosbeaks

SERVANTS OF THE TREES

By Hugh M. Halliday

Photographs by the author.

There are few subjects in the field of natural science which are of greater importance than that part which birds play in freeing our crops, orchards and forests of injurious insects. In summer, warblers, vireos and kinglets prey upon insects and their eggs that are confined to twigs, blossoms and leaves; while in winter, the creepers, chickadees and woodpeckers search bark and wood for cocoons, hibernating insects and borers.

Every insect enemy of the trees is the special prey of birds of one kind or another. It is difficult for one who has never made a study of the food of insectivorous birds, or closely observed birds pursuing their normal habits, adequately to appreciate their economic value.

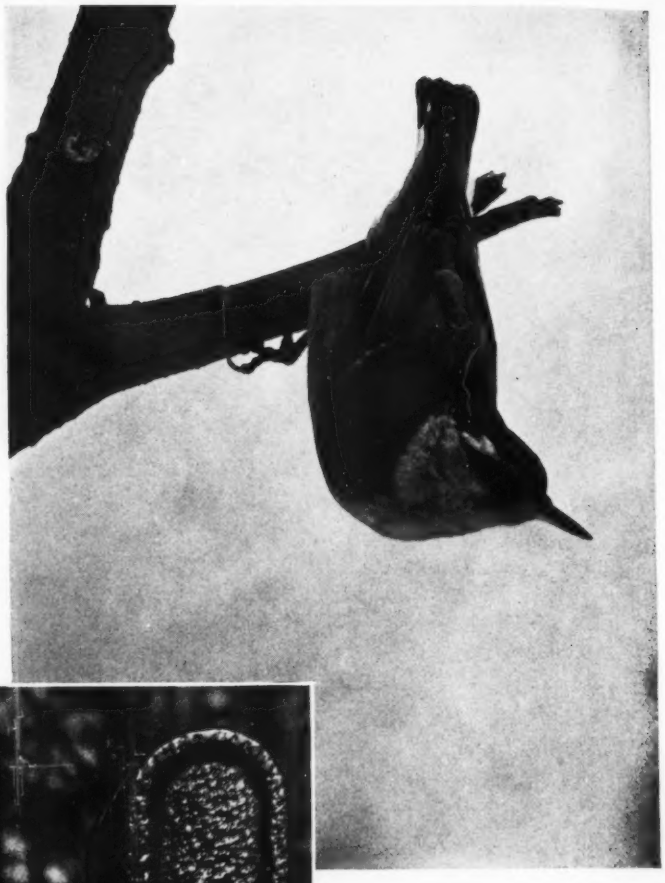
During the nesting season, a pair of rose-breasted grosbeaks for instance, will spend sixteen hours a day at pest control. If cankerworms happen to be the food supply, eight or ten worms are taken to the young on each trip to the nest, and that adds up to two or three thousand a day.

A vast army of birds is working for us, but this army could and should be increased. It performs its task free of charge, and it never takes a holiday; yet we are inclined to ignore it. Because we ignore it, we often hinder it, thus depriving ourselves of its great service.

During the long winter months the trees have other friends, too. These are the nuthatches, chickadees and creepers which, though smaller, play just as great a part in pest control. Nearly every insect enemy of the trees provides food for chickadees, and it has been estimated that a single chickadee destroys as many as five thousand cankerworm eggs a day. Hosts of scale insects and plant lice too small for us to see, which suck the life-juices from leaves, fruit, and from beneath the bark, are kept in check by these birds

The downy woodpecker shown above and the hairy at right, are, among other woodpeckers, sometimes accused of doing harm to trees by boring through bark. The truth is that what little harm they may do, if any, is far outweighed by their extensive insect control work. Food of the downy consists of the wood-boring larvae of beetles, weevils, and the like, and probably his method of tapping on the bark reveals their presence. Unless the wood or bark are so infested, he will waste no time drilling

It is in winter, when the woods are leafless, that the activities of woodpeckers are most noticeable, and a brief observation will reveal how thoroughly they scour the bark of trunk and limbs of every tree in their particular territory. Hibernating, or dormant in the pupal stage, no insect is safe from the attack of woodpeckers, for these birds are cleverly adapted to seeking their prey, and are never happier than when, with barbed tongue and chisel-like bill, they are dragging cocoons from beneath loose flakes of bark.



The northern white-breasted nuthatch shown above is a species that carries on his work of insect control over a wide part of North America, for he ranges from southern Canada south to Texas and South Carolina. Other members of his family are found in all parts of our country. The black-capped chickadee shown at left in a characteristically inquisitive mood is found in an extensive range that reaches from southern Canada to Missouri and North Carolina, but his relatives, too, inhabit nearly all of this continent, Mexico and Alaska

To attract birds we must consider their needs—their nesting requirements and their feeding habits. Just as we humans need shelter, though not all of us may like to live in the same kind of place, so too, do birds need shelter, though not all of them like the same kind of habitat. There are those which live and feed near the ground among the grasses, plants and ferns; there are those which inhabit low shrubs and the smaller understory trees; those which dwell in hollow trees; and there are those which keep to the high tree tops. Where there is water, there you will find the greatest concentrations of birds, for they, too, must have water.

How can we increase the bird population? This is a broad subject, but to treat it briefly let us ask these questions: Would it not be wise to allow the fields of hay to remain unmowed long enough to allow the nestlings of field-inhabiting species to depart from their nests and join the army of insect-destroyers? Would it not be wise to allow hedgerows to grow up along the borders of fields to provide cover and nesting sites for the species that will inhabit them, so that these birds can lend their aid in protecting our crops and orchards? Is it not also advisable to leave an occasional hollow or dead tree standing in the woodland or forest to offer shelter and nesting sites to those species which cannot exist without them? And would it not be well to keep to a minimum the number of cats around home and farm?

Investigation shows that the "harmless, necessary cat" is neither quite so harmless nor quite so necessary. An estimate places the number of cats in the United States at 20,000,000, and these, it is further estimated, take an annual toll of 1,000,000,000 insect-destroying birds a year.

If we help the birds, they will help us.

We gain further understanding of the economic value of birds upon learning that each one of these young downy woodpeckers, like most other young birds, may consume its own weight in insects a day

CANADA'S FIGHT FOR THE MUSK OXEN

By E. R. YARHAM

IN THE long story of mankind's dealings with the animal world there is no more tragic chapter than that of the ruthless slaughter of the plains buffalo, of which there were once about 50,000,000 in the New World. And while this slaughter was going on, so too was that of the musk ox, an interesting beast which could play a tremendous part in the economy of Canada's northern territory. At the beginning of the last century there were perhaps 1,000,000 of these animals; today their numbers have been reduced to 25,000. The Canadian government, it is encouraging to record, is doing its best to recruit the strength of the surviving herds. It is to be hoped that something on the same lines will be done in Greenland where slaughter is still only too rife.

From a scientific point of view, the musk ox is of great interest because it occupies a unique position in the animal world. It is not, strictly speaking, a link between the sheep and goats on the one hand, and the cattle on the other, but is intermediate between the two. The name is given because of the flavor of musk with which the flesh is tainted, an odor which can be detected at a distance of 100 yards.

A bull musk ox is about two-thirds the size of a bison. Its appearance is deceptive, the tremendously thick coat making it look larger than it really is. The live weight of an average bull is given by the explorer, David Hanbury, as 579 pounds. The head is sheep-like, and the coat next to the body is very fine and soft, woolly, and of a light brown color. The outer hairs are thick and matted, curly on the shoulders, elsewhere straight and hanging down.

The musk ox inhabits a territory where even in summer the surface soil scarcely thaws, yet it thrives, and this is one of the outstanding reasons for conserving the species. Few creatures can live and put on flesh in these far northern areas. Musk oxen would supply a valuable addition to the food of the natives. They can sustain life on the natural vegetation found in most parts of the Canadian Arctic. Grass is eaten, and also lichen, moss and willow shoots.

The flesh of the musk ox—excluding old males, in which it is rather musky and rank—is excellent. It compares favorably with beef, being very nutritious and palatable, and even more tender and luscious. The animal also gives milk, equal to that of the domestic cow, though smaller in quantity. Its skin makes good leather, and the wool is of considerable value. If domesticated—Stefansson says they are admirably suited to this—musk oxen would undoubtedly prove of great value to the northern tribes and to the Eskimos.

At one time the range of the beasts was far greater than now. Fossilized remains have been found in Pleistocene deposits in Siberia, Russia, Germany, Austria, France and England. Within historic times they have been confined to North America and Greenland. Dr. J. A. Allen, the distinguished American zoologist, states that the range of the musk ox in North America formerly nearly coincided with the southern border of the Arctic tundra or barren-grounds, extending from the west coast of the northern half of Hudson Bay west to the Great Slave Lake, and thence northward to the eastern arm of Great Bear Lake and to the Arctic coast eastward of the Mackenzie River.

As pointed out, the numbers of musk oxen have been sadly reduced, and they are now extinct outside Canada except for about one-fifth of the Greenland coast from Cape May in the north to Scoresby Sound halfway down the east coast. In recent years, as Mr. Stanley P. Young described in the August issue of AMERICAN FORESTS, a small herd has been established in Alaska. The barren grounds commence about latitude sixty-four degrees north, and stretch towards the Arctic Sea, from whence the habitat of the musk ox extends northwards and eastwards through the Parry Islands and Grinnell Land to Greenland.

There is a tradition that a musk ox was killed on Baffin Island, but the creatures no longer exist on Southampton Island or the islands in Hudson Bay, or on any of the larger islands lying north of the mainland and south of Lancaster and Melville Sounds. They are found, however, on Melville Island, Ellesmere Island, Axel Heiberg Island, Devon Island, Bathurst Island, Prince of Wales Island, Cornwallis Island, Victoria Island, and on the mainland in the Thelon Game Sanctuary and in a few other areas.

The animal's mode of defense has been partly its undoing. Musk oxen are very agile, swift, and sure of foot. Explorers have spoken of their almost incredible speed even through snow. The trouble is that when attacked by wolves the beasts do not make their escape but form into a rough circle with the cows and calves in the middle and the bulls facing the enemy. As a rule they can defend themselves against wolves with lightning-like thrusts of hoof and horn, and then they drive them off by a sudden combined charge. Knowing this, natives employ dogs to hold a herd at bay and divert their attention while the hunters bring down the animals. The enraged beasts seek to destroy the dogs and remain until every adult has been killed.

Two factors have been in favor of musk oxen in recent times—the definite amelioration of climatic conditions during the past sixty years and the lessening numbers of wolves which seize upon straggling calves. Unfortunately, although hunters have destroyed the wolves, they are also guilty of decimating the musk oxen herds as well. It is irrefutable that while native hunters have been responsible for extermination of musk oxen in some parts of the interior, the blame for their decreasing numbers on Greenland, Ellesmere, Melville and other islands must be laid upon white men.

During the past century many expeditions relied to a large extent on the musk ox to feed their members and great numbers of sled dogs, and innumerable whalers, sealers, and fishermen have landed and killed thousands of the animals for hides and meat. In the early days of whaling in the western Arctic many ships wintered in the north, and both white and native hunting parties were despatched to procure winter meat supplies—and the musk ox was frequently the victim.

That slaughter in Greenland has been excessive is certain, both on the evidence of the inspector of East

Greenland, Captain Mikkelsen, whose work of settling Eskimos was highly valued by the famous explorer, Dr. Charcot, and of the American Committee for International Wildlife Protection, whose "serious concern regarding the survival of the Greenland musk oxen" caused them in 1934 to publish a large volume on the subject. In it occurs this passage: "The east Greenland animal has for the past forty years been the victim of white men, and for the past fifteen, of trappers staying there the year 'round. This has come about because the east coast fronts the hunting and fishing grounds of many northern European nations, whalers and sealers having been particularly active in these waters. . . . Commercial musk ox hunting has been very destructive. When the adults defending them have been shot down, the calves were entangled in nets. Hundreds of musk oxen were thus killed."

On the accessible islands calf hunting for specimens for zoological gardens has caused great havoc, for in many cases the adults are killed first. One authority, describing calf hunting in Greenland, states ten adults were killed for every calf captured; others say from five to seven adults were salughtered for every calf; on the other hand, in two instances only were calves taken without harming the adults. It is estimated that hunters kill 500 animals in Greenland in a year.

Lord Moyne, who has taken great interest in the preservation of many species, is particularly interested in the musk ox. He has studied the position in Greenland where, in spite of many representations from zoologists, there is no law against their slaughter by Europeans. This seems due to the Danish government fearing that protection of the musk ox would cause friction with the Norwegians. The difficulty dates from the treaty of 1934 between Denmark and Norway under which certain rights were conceded to settle a long standing controversy with regard to Norwegian sealers. In consequence of this agreement, some few Danish and Norwegian hunters are scattered southward along the coast from seventy-five degrees North latitude, about which, in ordinary years, it is possible for suitable ships to force their way through the floe ice.

Lord Moyne sums up the situation thus: "From the three-volume publication of the Commission for the Direction of Geographical and Geological Investigations in Greenland, it seems clear that protection for the musk ox has been withheld by the Danes because it would be unpopular with the Norwegians. There is, therefore, the anomalous position that the Eskimos are forbidden under heavy penalties to destroy the musk ox, whereas nationals of those countries enjoying most-favored-nation treatment with Denmark are free to slaughter these animals in the districts north of Scoresby Sound." The Greenland Treaty reserves power to Denmark to declare protection for species which are endangered. Action in the case of the musk ox is greatly overdue.

When Norway claimed rights on the eastern coast of Greenland the question of musk oxen gave great concern to both those friends of the Eskimos, Dr. Charcot and Captain Mikkelsen, previously mentioned. M. Y. Goblet, member of the Geographical Society at Paris, summed up their opinion after long talks: (*Continuing on page* 448)

The musk ox at home in Greenland, where he thrives—even though in summer the surface soil scarcely thaws. Musk oxen graze quietly, very much as domestic cattle do

U. S. Forest Service

Equipped with photographs of the area, a stereoscope and binoculars, the modern timber cruiser maps the types on the picture as he sees them on the opposite slopes

THE TIMBER CRUISER GOES MODERN

By THEODORE KRUEGER

THE timber cruiser has gone modern. No longer are laborious, time-consuming and expensive ground surveys necessary to determine the amount, size, species and availability of timber in mountainous forest areas. The compass and chain have surrendered to the fast flying airplane and the present day cruiser, with aerial maps and high powered binoculars, is able to estimate timber more accurately, within a shorter time, and at a much lower cost per acre.

Various kinds of timber estimates have been made since the early days of forestry and the lumber industry. Some cruisers merely walked through the forest and from experience estimated the amount of timber on the ground. In the early days this often was sufficient. Then the system of actual ground surveys was developed. In this the cruiser, with compass and chain, ran estimate strips 330 feet apart through sections a mile long. If the strip in which the estimate of the timber was made was sixty-six feet wide, a ten per cent cruise of the timber on 160 acres was obtained, generally considered a good estimate. Each tree above a certain diameter on the strip was measured, its timber contents determined later from volume tables.

A survey crew mapped everything 330 feet on each side of the compass line, but if it was in dense timber, or in mountainous country, the mapper was unable to see 330 feet, and frequently a good job of estimating was spoiled by poor mapping. To make the map, cliffs on the strip line had to be scaled and open areas had to be chained through. Much time was lost in having to go through these areas for the sake of getting a map.

Against this old method of ground surveys the Federal Forest Service has been experimenting with a new system of using aerial photographs. In many regions, such as the Rocky Mountains, timber types are not continuous. These differences in types, or location of roads, streams, farmlands, power lines, or other features are plainly shown on aerial photographs. Open parks show almost white, bodies of water show in black, aspen in gray. Also, the density of timber is plainly shown on the aerial pictures.

Flying at an altitude of 22,000 feet above sea level, pictures are taken by automatically timed cameras at intervals of one and one-fourth miles along the line of flight, the actual timing, of course, depending on the speed of the plane. The whole area to be photographed is cov-

ered by flight lines two miles apart. The pictures are not always perfect, and occasionally it is necessary to refly areas. Wind currents, especially at the higher altitudes, occasionally tip the plane, or it happens that areas are missed entirely, or the picture is so distorted that it cannot be used. Generally, only the center part of the picture is used, but the overlap of adjoining pictures is such that they cover the outside parts of the same area.

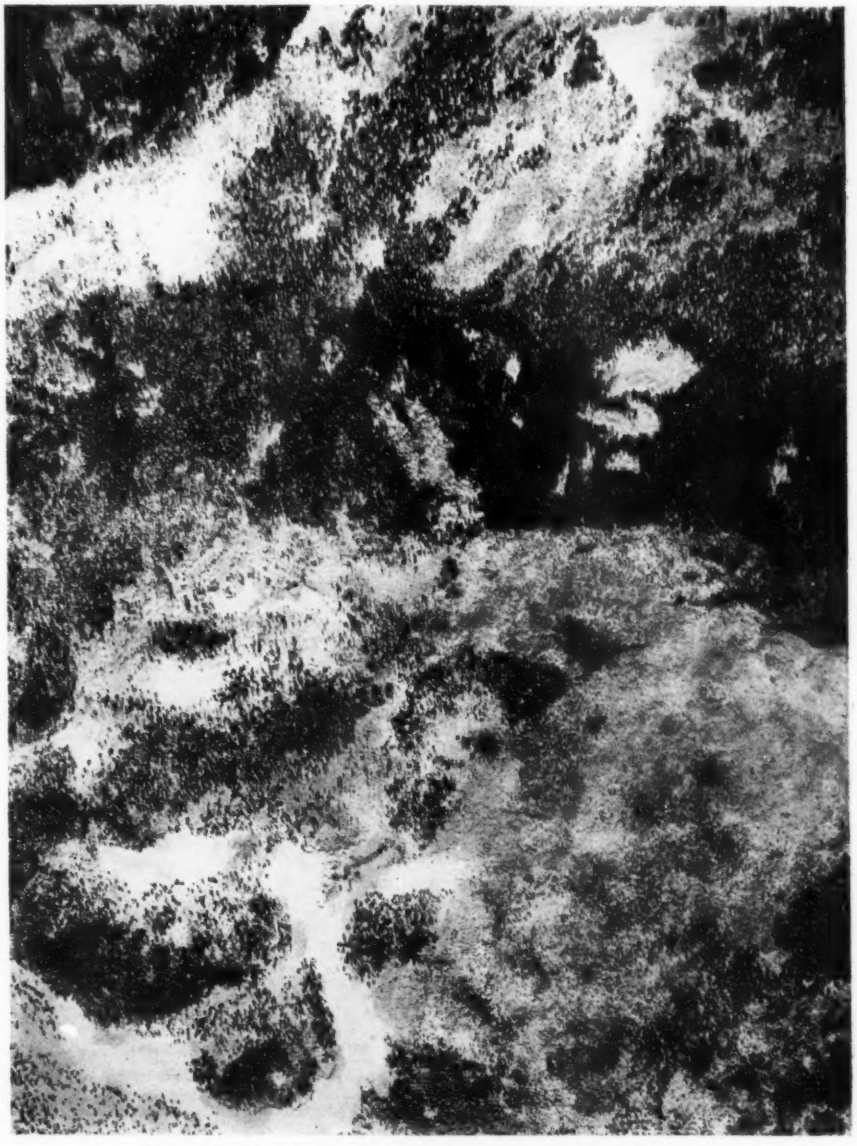
Five hours of photographing will cover 900 square miles. The cost is about $2.00 a square mile, including the film and one print of each picture.

The modern timber cruiser of the Forest Service in the Rocky Mountain region starts out in the morning carrying the photographs of the territory he expects to cover that day, a pair of high power binoculars, and a stereoscope. He starts at the lower end of the logging unit and works along one boundary ridge to the head of the unit, following back down the opposite ridge. From every point of vantage he maps type lines on the opposite ridge. The stereoscope brings the picture out in relief and its use is occasionally necessary to distinguish between types. Before long such new developments as the tri-vision prints will make the carrying of stereoscopes unnecessary.

The mapper endeavors to find and indicate on the photo with standard symbols all known survey corners and roads, or other features which may have been constructed since the picture was taken. Actual points are pinholed and a description of the point is then written on the back of the photograph for reference.

After the timber, cultural features, location of streams, ridges, logging unit boundaries, or other desired information has been drawn and inked on the photograph, it is ready for the use of the timber estimators. But instead of running regular strips at stated intervals as in the ground survey method, he merely needs to take sample plots in the smaller type areas or representative sample strips through the larger areas of the merchantable timber. Non-timber areas, areas of reproduction, and non-merchantable timber areas are merely mapped on the photograph. Thus the work of the estimator can be confined to estimating volume on areas of merchantable timber.

When the field work of mapping and estimating is completed the pictures are bleached so that only the inked-in type lines and other features wanted on the final map are visible. Since the pictures are not always on the same or on the right scale, they are then put in a projector brought to the scale desired for the final map, to which they are now transferred. Thus by use of aerial photographs it has been possible to secure here more accurate type maps and timber estimates at a cost of about four cents an acre for areas which under the former ground survey method would have cost from eight to ten cents. Much timber-survey work is urgently needed to give the necessary basic information for stabilized wood-using industries and aerial survey methods, where applicable, will in the future give this information in a better way than has been possible in the past.



Modern aerial photographs of timbered regions plainly show location of timbered areas, roads, streams and differences in timber types

FORESTRY WITHOUT PUBLIC REGULATION

A. B. Recknagel

On the company's lands—beautiful Hanging Spear falls on the Opalescent River—a tributary of the Upper Hudson

By A. B. RECKNAGEL

THIRTY years ago Finch, Pruyn & Company, Inc., of Glens Falls, New York, inaugurated forest management on their Adirondack holdings, and upon the advice of the late Austin Cary, appointed Howard L. Churchill as forester to the company. Mr. Churchill began his work in 1911. He had had practical experience in logging and lumbering and technical training in forestry at Maine University. One of his first duties with the company was the preparation of a plan to assist the company to handle its holdings to the best possible advantage, taking into account both the present time and the future. This plan included a system of maps showing both topography and timber, an accurate estimate of merchantable timber arranged according to watershed areas or logging units, estimates of the sustained annual yield and concise recommendations for future logging operations.

Looking back previous to the appointment of Mr. Churchill in 1911, the history of the company was that of a successful company in existence since 1865 and operating a sawmill continuously until it was closed in 1923. In 1905 a newsprint mill was added, originally for sixty tons daily capacity, and later increased to 150 tons capacity. Cutting operations on the company holdings from 1866 to 1890 dealt with sawlogs only. That year the cutting of sawlogs of small size for pulpwood was begun and continued until 1915 when the cutting of four-foot pulpwood was started.

In the beginning of forest management under Mr. Churchill, the company decided upon and has since adhered to a policy of sustained yield cutting of its timber in so far as possible. Additional acreage has been acquired to support this policy.

The pulpwood felled and peeled in the early spring, is hauled to the streams in winter. The river drive is short—about 100 miles—as all the timberlands are on the Hudson River drainage, and tributary to the mill at Glens Falls. This pulpwood is in the first pond. Note the men standing on the ice near the boat

Between the years 1911 and 1923, 100,000 acres were added to the holdings, bringing them up to approximately 200,000 acres in the Adirondack Mountains of New York State. Of this ownership ten per cent has been in the company's hands for over seventy years; another ten per cent has been in the company's hands for fifty years; forty per cent for forty years and the remainder for over fifteen years.

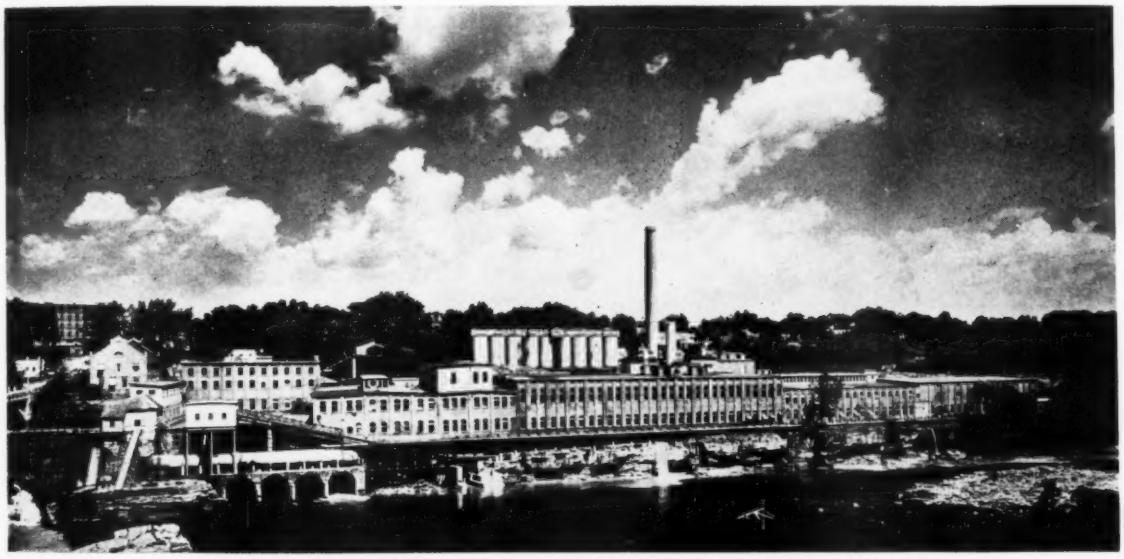
Mr. Churchill's working plan developed into an intensive growth study made in 1923, which revealed the need for additional classification of the land according to its best use, a project successfully completed in 1930 and 1931. The administration of the holdings of the company has revealed the interesting fact that taxes are the principal burden. They constitute over two-thirds of the total carrying charges of forty-nine cents an acre annually while the other components are administration, including surveying, research, cultural measures and general expense, fifteen cents an acre; fire protection, one cent an acre and social security and unemployment insurance, two-thirds of a cent an acre. The rate at which the real property tax has increased in recent years is significant. Between 1904 and 1928 it increased five per cent yearly. In 1928 taxes were increased ten per cent; in 1936 fifteen per cent and the present high level is not only continuing but will doubtless rise.

Altogether, in the period 1918 to 1937, a total of almost a million dollars has been paid to local communities in taxes. Also during recent years the woodlands payroll of the company has substantially contributed to the public welfare. It amounts to an average of $300,000 yearly and the number of men employed in the woods averages 250. At this point a digression is made to quote a letter from Mr. Cary to the author after a visit to the operations of Finch, Pruyn in 1925—mid-point in the thirty year forest management plan of the company:

"Churchill and I had a long talk about things in the Finch, Pruyn Company and later I also had a short but searching talk with Mr. Ostrander. You will guess the substance of these conversations pretty well. This idea shaped itself in my mind as a result of them—that that company is meeting every demand made on it by the ideas embodied in the term forestry, is doing everything in that line that their own or the public interest can be reasonably considered to demand. I tried to think up something lacking, something that they were not at least trying to meet, and couldn't. The only questions I could raise were of method, timeliness, etc.; it struck me as possible that in some directions they might be going a little fast. Of the genuineness and substantial nature of their efforts I couldn't raise any question at all."

Those who recall Mr. Cary know that he praised only where praise was due. Mr. Ostrander is the Vice President of the corporation and its woodlands are under his management.

In 1930 Mr. Churchill was forced to retire from active work, due to ill health, and in 1935 Mr. Thomas H. Crawshaw succeeded him as forester. Mr. Crawshaw has been with the company ever since 1920 and has very capably carried on the policies established by his predecessor. These policies in effect are simple but worth noting since they constitute a practical demonstration of forest management.



The plant of the Finch Pruyn Company, which thirty years ago inaugurated forest management on their holdings in the Adirondacks. The success of their broad operating program is a fine demonstration of private forest practice without public regulation

The principal species of softwood timber found are spruce and fir, with small quantities of hemlock and pine. There are also quantities of hardwoods, chiefly maple, birch and beech. Classification has shown the following areas in the different forest types: softwood producing lands, forty per cent; mixed hardwood and softwood lands, thirty-three per cent; old growth hardwood lands, twelve per cent; second growth hardwood lands, five per cent; burns and areas of non-merchantable growth, four per cent; open marshes and water, five per cent.

Before the spruce and fir pulpwood is cut, the areas are first determined and marked out on the ground. Then the trees to be cut (*Continuing on page* 442)

TAMARACK

Larix Laricina (DuRoi) Koch

By G. H. COLLINGWOOD

FROM the Atlantic to the valley of the Yukon, north to the limit of tree growth near the Arctic circle and along the shores of Hudson Bay, tamarack, or eastern larch extends south throughout much of Canada, New England and New York, into Pennsylvania, West Virginia, Ohio, Michigan, Indiana, Illinois, Wisconsin and Minnesota. Its slender, sparse and feathery, clear green summer crown contrasts with the dark green heavier foliage of other conifers. In winter its bare orange-brown branches form a delicate tracery.

Devereux Butcher

Slender and sparsely foliaged, tamaracks are often fifty or sixty feet tall

On well-drained uplands and occasional cool sphagnum swamps of its southern range tamarack grows in mixture with black, red, and white spruces, hemlock, balsam, aspen, paper birch, alder, northern white cedar, willow and red maple. The occasional pure even-aged stands are crowded. One by one its tree companions drop out from south to north, until the last to remain are black spruce, red spruce, aspen, paper birch and finally, the willows. Toward the Arctic circle growth is scattered and dwarfed. This tree sustains itself from sea level to elevations of 4,000 feet; from the relatively mild climate and humidity of the Atlantic Coast to the interior of Alaska.

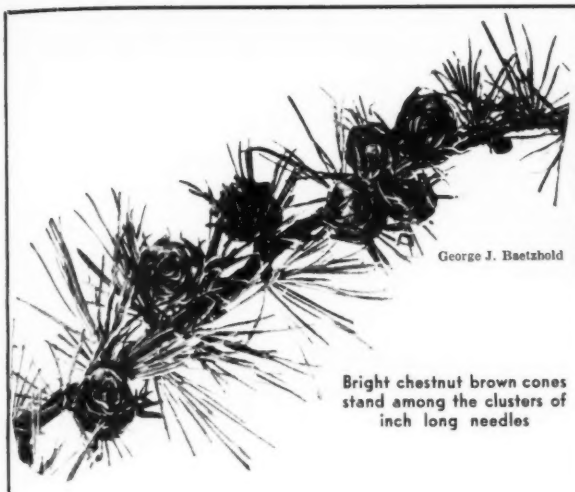
The broad, shallow root system is adapted to swampy ground, but best growth is made in fresh, well-drained soils.

The straight, slender tamarack is seldom more than fifty to sixty feet tall with a trunk eighteen to twenty inches in diameter, but on the low benches north of Lake Winnipeg trees reach one hundred feet or more with diameters of two feet.

In youth the crown is narrowly pyramidal, with a

U. S. Forest Service

From late September until April the crown and horizontal branches are bare of foliage



George J. Baetzhold

Bright chestnut brown cones stand among the clusters of inch long needles

Frank Wallace

Pale green new leaves of early spring appear with rose red pistillate blooms

flexible terminal shoot. With age trees become irregular, and those grown in the open maintain a low broad head. The slender upper branches are horizontal or slightly ascending, the lower ones droop in long sweeps, and the straight trunk tapers rapidly. Trees grown within forest competition may be clear of branches for half or more their length.

Clusters of twelve to twenty bright green, soft, bristle-like leaves grow on wood of the previous year, or singly on the new shoots. They are three-quarters of an inch to an inch and a quarter long and triangular in cross section. The upper side is rounded, and the lower sharply keeled. In early spring the new leaves are marked with breathing pores or stomata. By September or October the leaves turn yellow and fall. This feature was noted by the Iroquois Indians whose name "Ka-neh-tens" means "the leaves fall."

The delicate green tracery of the spring foliage is punctuated with clusters of inconspicuous, stemless yellow staminate or pollen bearing blooms on the one or two year old orange brown branchlets. The more showy pistillate cones grow on short lateral stalks of one to three year old twigs. They are like small flattened spheres, with green-tipped, rose-colored bracts growing out between the red scales. At first they stand erect, with scales spread ready for pollination. Later they droop and close their scales while the seeds develop. By autumn they stand erect again, are chestnut-brown and one-half to three-quarters of an inch long. During the fall and winter the scales spread to liberate the chestnut-brown winged seed.

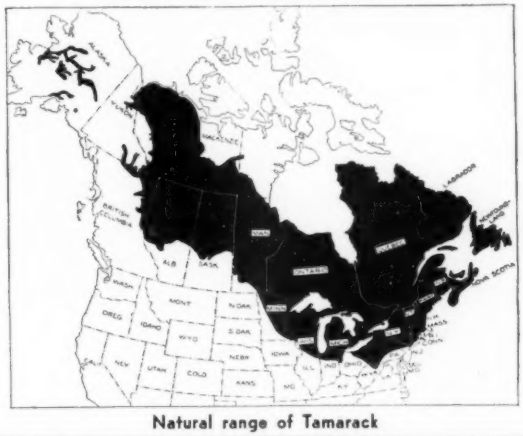
The reddish brown bark of mature trunks is a half to three quarters of an inch thick. Its surface is broken into thin, brown, closely pressed, roundish scales. Young bark is smooth and light orange.

A cubic foot of the tough, resinous, coarse-grained wood when dry weighs about thirty-nine pounds. It is light brown, with thin, nearly white sapwood. Because it is durable in contact with the soil it is used for railroad ties, posts, sills and for boats. Its other uses include excelsior, refrigerators, cabinet work, interior finish and telephone poles. In 1939 Wisconsin, Minnesota, Michigan, New Hampshire and New York produced 2,852,000 board feet of lumber.

Next to fire, its worst enemy is the larch saw-fly which often kills large areas of tamarack forest.

George J. Baetzhold

The reddish brown bark has shallow furrows and is about half an inch thick



Natural range of Tamarack

FIRE POSTERS

13½" x 20"

NOW AVAILABLE!

Members and friends of the Association are familiar with the Forest Fire Prevention Poster Stamp pictured above. Sold in sheets of 100 at $1 a sheet, these stamps are now being widely used throughout the Nation. Used on letters, postcards, and packages they provide a quick and effective means of reaching large numbers of people with an important fire prevention message.

Because of the expressed interest of State Foresters, private organizations, and individuals concerned with fire protection, the Association has made available this same 4-color design in a large size poster—measuring 13½" x 20". Lithographed on 80 lb. offset paper, a white strip is provided at the bottom for imprinting the name of the organization or individual purchasing them. The Association can arrange for this special printing at slight extra cost depending on quantity ordered or it can be done by your local printer. However the posters are complete without such printing.

POSTER PRICES, Postpaid	
10 or less	10c each
11 to 100	7c each
100 to 1,000	5c each
1,000 to 10,000	4c each
Over 10,000	3½c each

The supply of these posters is limited but orders will be filled promptly as they are received. Send for your supply today and help spread the vital message—"DEFEND AMERICA — INDUSTRY MUST HAVE RESOURCES — PREVENT FOREST FIRES."

ORDER BLANK

Please send me ..... Forest Fire Posters.

I enclose $.....

Name .....

Street Address .....

City ..... State .....

Fill in, and return to

THE AMERICAN FORESTRY ASSOCIATION

919 SEVENTEENTH STREET, N. W. WASHINGTON, D. C.

EDITORIAL

FATHERS OF THE WILDERNESS

RECENT issues of *The Living Wilderness,* published periodically by the Wilderness Society, have contained some brief but interesting articles that form the beginning of a history of the wilderness movement in America. This gathering of information while it is fresh in living minds is a valuable service to the history of American conservation, because the preservation now of wilderness conditions in some of the still wild and unexploited recesses of our vast land expanse is destined to play an important part in the lives of our people.

Who first gave expression to the need of the wilderness for modern man to resort to for the good of his soul and his physical being is not known. Far in advance of the complex and warring civilization of today, Thoreau sensed it but the idea seems not to have gripped the minds of many men until the early 1920's. It was in those years that Aldo Leopold and others in the Southwest began to interpret the need of the wilderness in terms of our modern civilization and to warn that unless public action soon was taken to preserve some of the wilderness regions then remaining, there would be no American wilderness to preserve. Those were the formative men and the formative years of the wilderness movement in this country.

Among these men was one whom all the writers in *The Living Wilderness* singularly have overlooked. He was Emerson Hough, noted writer and author, who visited the Kaibab Plateau in the summer of 1921 and published in the *Saturday Evening Post* the following January one of the most inspiring and convincing articles in wilderness literature. Mr. Hough had a definite, concrete suggestion. It was that the Kaibab Plateau with its beautiful primitive forest of pine, spruce and fir be set apart as "The President's Forest." Below are quoted some extracts from his article indicative of the deep wilderness feeling which moved him:

"It (The President's Forest) should be in truth the Forest of America. It should be the noblest in all the world, holding the most austere and regal beauty on earth. It should be set apart to remain unchanged forever, the grandest natural work of Almighty God now left in all the world! There is one and only one remaining spot in all America which has such beauty. It still is ours as a national possession. We still own as a nation the most beautiful forest of pine, fir, and spruce ever known in America, the largest body of virgin timber of any description now out-of-doors in the United States. It is beautiful beyond comparison. It is almost fifty miles in the square, but it has not been used and it would not be commercially missed. If we cut it down we should not solve one industrial problem. We should only leave a greater problem forever unsolved. * * * * *

"It can be true, and is true. All the earth holds no beauty such as lies practically unknown in the very last and very finest wilderness the United States now has or ever did have. * * * * * It belongs to time, to humanity, to the King who loaned it to us. Who are we that we shall not give back to the King what is his own? If we do not we are none the richer. If we cannot we are poor indeed.

"The reason why this tremendous wilderness north of the Grand Canyon has so long remained almost unknown is perfectly plain and simple when you come to look into it. We have this wilderness because we could not get at it. * * * * * "But this, then, is the story of the President's Forest, which, if we be patriots and if we be unselfish men, we easily can set aside to remain aloof and apart forever, to show other Americans as yet unborn what the old America once was, how beautiful, how splendid. The colors will not die between now and then. The walls above and below the earth will not change between now and then. Through our fault alone can the immemorial whisperings of the pines be stilled, telling of other hearts and other tongues—our own, then to be gone.

"Will it pay?"

"The old, old American question. As though anything else we now can do would pay as well! Pay? Yes, pay immeasurably, illimitably, unspeakably, and in a hundred ways, material and spiritual alike.

"If our great men, our leaders, shall do this thing, largely, finely, not hagglingly, every conflicting interest will be composed. We shall save a great and typical portion of the American wilderness. We can never save it in any other way. * * * * *

"Pay? If every future President of this republic, representing in himself no royalty, but meaning a great people, should stand hat in hand on the point called the President's Point, and look out over the Grand Canyon until his eyes dampened in the humility of real leadership, while he made his own obeisance to America—don't you think that would pay? It would pay—pay him and us, and our children's children's children. * * * * *

"Pay? What does pay? Why, forethought has always paid. Statesmanship has always paid. Politics never has."

The Hough article had wide reading by the American public—wider probably than any article of similar nature previously written because there had been few and these mainly in technical journals. The extent of its influence in planting the wilderness germ in the American mind is, of course, not known but it must have been widespread and Mr. Hough is well deserving of a place among the fathers of the wilderness. (The quoted lines reprinted by special permission of *The Saturday Evening Post,* copyright 1922 by The Curtis Publishing Company.)

If War Comes to the Forests

(*Continued from page* 409)

the greatest threat. But what is feasible striking distance? The British R.A.F. have successfully flown from England over the Alps and bombed airplane factories in northern Italy. They have made this round trip time and again. It is now reported that we have a plane with a non-stop range of seven thousand miles. If we possess such planes so, we can assume, may our enemies. And this range may be much greater two years from now.

Where could the enemy acquire these bases? Look again at the map of the Pacific slope and of our neighbors. Is there anyone gullible enough to believe that the influence of the totalitarian nations does not affect large groups of individuals who would make it possible for planes to be serviced and sent to attack the United States? These bases could be a thousand or two thousand miles from our borders and yet planes could still sow fire pills on our forests and return to their bases. By sacrificing their planes, pilots might fly much further and still accomplish their mission, then parachute to the ground and take their chances on escape. And don't forget the private planes which could be used by saboteurs who may be already here.

What is the defense, then, against the planes from outside our borders? This would be a technical problem for the army and navy air arms. But it would seem necessary to station interceptor planes at interior air fields as well as along the coast. This would also make necessary the needed development of interior emergency fields. These planes could patrol and carry on their routine training. The problem of private planes being used would call for the cooperation of the aeronautical commission and the air arms. There would also be such problems as enemy planes sneaking in at night to sow fire pills. Only men trained in air defense can plan to meet such technical problems.

As for the suppression of the fires once they start, that is a job for the United States Forest Service, the State forestry organizations, the State Guard, the CCC and the Park Service to make their individual and joint plans. The present organizations are excellent foundations on which to build, train and equip enough men to fight thousands of fires in one day if necessary.

In a forest and watershed area of, say two hundred thousand acres where one ten-man suppression crew has been suppressing twenty-five or so fires annually, there might have to be ten or even twenty suppression crews properly distributed. Part of these would have to be full time crews and part could be crews of local men in each community, organized, trained and equipped to guard a given area. The State Guard in each state, or any other group of able-bodied men, should be trained in the rudiments of fire fighting so that they could be used as relief crews.

For this reason all mountain roads and trails would have to be open and in a condition to allow crews to reach any part of the forest as rapidly as possible. More telephone lines to lookout and ranger stations would be necessary. Remember SPEED and TRAINED man power are the keys to forest fire control, for even under hazardous conditions fires usually start slowly—but each minute increases the momentum and spread of the blaze. One fire fighter might control a fire which has burned for thirty minutes, but after it burns for one hour twenty-five men may be helpless to stop its charge.

Fire control, then, depends upon properly distributed, well trained and equipped crews who can get there and attack the fire while it is small.

To augment the phone lines there should be an increase in the use of short wave radio and to offset the destructive power of the airplane and its fire-setting pills the use of parachute jumping fire fighters would necessarily become a part of the initial attack against fires set in the inaccessible rough country of the forest which, at best, it would take ground crews several hours to reach.

Parachute smoke jumpers have been used effectively in the isolated forests of Idaho and Montana for the past three fire seasons. Even the army air corps has studied the methods of the smoke jumpers and learned a few tricks.

So far in history every effective weapon of destruction has eventually been met by a means of defense. For several years there has been talk of a chemical bomb which would have the ability to spread over a wide radius and suffocate a fire. Perhaps the demands for such a means of defense will make necessary the perfection of this bomb, or some similar device.

How could we deal with the "fire bug" saboteurs on the ground? The fires which they may start would have to be controlled quickly like fires from any other cause. This can be done. It is done each year, not to the extent, of course, which wartime sabotage might make necessary. But in 1939 there were more than 8,500 incendiary forest fires in the United States and in spite of the fact that "fire bugs" are difficult to catch—they ARE caught by trained investigators.

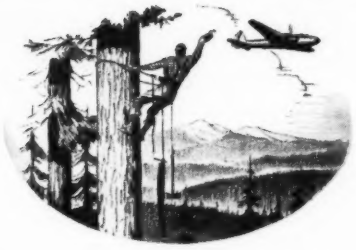
During the past few years in the forests of the California region there has been, during the deer hunting season, which opens in the fall, a system of registration and checking stations strategically located to contact the hunters for fire prevention and law enforcement as well as to offer whatever service can be rendered the hunters.

By installing a checking station on every road that enters the forest, manned

(*Continuing on page* 447)

TREES AND THEIR USES—No. 58—TAMARACK

THE TAMARACK OR LARCH IS WIDELY DISTRIBUTED OVER A PORTION OF ALASKA, NEARLY ALL OF CANADA EAST OF THE ROCKY MOUNTAINS, THE LAKE STATES AND NEW ENGLAND.
IT USUALLY GROWS 50 TO 60 FEET TALL AND OCCASIONALLY REACHES 100 FEET. ITS FOLIAGE IS THIN AND FEATHERY COMPARED TO THE THICK GROWTH OF OTHER CONIFERS.
TAMARACK GROWS ALMOST TO THE ARCTIC CIRCLE, LEAVING BEHIND ITS COMPANIONS OF THE SOUTH.
IN EARLIER DAYS THE PILGRIMS USED THE GUM OF
THE TAMARACK AS A BALM IN DRESSING WOUNDS. INDIANS USED THIS TREE IN MAKING THEIR CANOES. IT WAS HIAWATHA WHO SAID, "GIVE ME OF YOUR FIBROUS ROOTS, O LARCH TREE, MY CANOE TO BIND TOGETHER."
THE WOOD OF THE TAMARACK IS TOUGH, COARSE-GRAINED AND DURABLE IN CONTACT WITH THE SOIL.
IT IS USED FOR RAILROAD TIES, POSTS, SILLS, BOATS, TELEPHONE POLES AND EXCELSIOR.
-FADER-



Team-mates in Defense

THE High Climber in the forest scaling the giant spar tree and the aviator patrolling the sky are team-mates in defense. Both are fearlessly performing essential jobs.

The High Climber, 20 stories in the air, with axe and saw tops the tree. The spar is ready, a 200 foot tower of strength to which he attaches great cables. These are the sky lines of the forest along which enormous logs are carried to flat cars for transportation to the lumber, pulp and ply-wood mills, frequently many miles away. The High Climber is a symbol of the men of the lumber industry, always ready for the challenge of difficult demands. The efficient manner in which they are meeting the demands of America for lumber is a bright spot in the record of the nation.

Almost overnight the industry produced billions of feet of lumber for national defense, for the housing of soldiers and workmen—billions of feet of lumber to meet more than normal requirements for new homes, farm buildings, shops and factories—millions of feet for new and wider uses, often releasing other materials for defense needs.

Lumber is shouldering its greater responsibilities quickly, efficiently and economically because lumber is America's most adaptable building material. Its uses are many and varied. It is serving essential needs in aviation. It is fashioned into massive timbers for use in shipyards and in the construction of docks, bridges and vessels. Lumber is also indispensable to many other industries.

Lumber is abundantly available, and will continue to be available because the seeding and planting of new trees is replacing those that are harvested, assuring a continuing supply. Timber is a crop. It is America's greatest renewable natural resource.

Published on behalf of the Lumber Industry by

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CONSERVATION CALENDAR

Important Bills in Congress with Action July 2 to July 29, 1941

APPROPRIATIONS

S. 1200—BANKHEAD—To authorize additional appropriations to provide for the further development of cooperative agricultural extension work. Passed Senate April 4, 1941. Passed House July 21, 1941.

FISH AND WILDLIFE

H. R. 3361—BUCK—To provide that the United States shall aid the States in fish restoration and management projects. Introduced February 17, 1941. Public hearing held by the House Committee on Ways and Means July 15, 1941.

MEMORIAL PARKWAYS

H. R. 5376—MCGEHEE—To provide for the establishment of the Pat Harrison Memorial Park. Introduced July 21, 1941. Referred to the Committee on the Public Lands.

NATIONAL FORESTS

S. 852—MCNARY—To provide for the acquisition of certain lands for and the addition thereof to the Deschutes National Forest, Oregon. Passed Senate June 30, 1941. Referred to the House Committee on Agriculture July 8, 1941.

H. R. 4733—FULMER—To add certain lands to the Boise National Forest, the Salmon National Forest, and the Targhee National Forest in Idaho. Passed House July 7, 1941. Referred to the Senate Committee on Public Lands and Surveys July 10, 1941.

H. R. 4975—ELLIOTT—To add certain lands to the Sequoia National Forest in California. Reported without amendment by the House Committee on the Public Lands July 10, 1941.

NATIONAL MONUMENTS

S. 752—HAYDEN—To provide for the establishment of the Coronado International Memorial in Arizona. Passed Senate amended May 26, 1941. Reported without amendment by the House Committee on the Public Lands (Report No. 927) July 10, 1941.

NATIONAL PARKS

H. R. 2300—ROBINSON—To correct the description of land added to the Bryce Canyon National Park. Reported without amendment (Report No. 923) by the House Committee on the Public Lands July 10, 1941.

H. R. 2320—WEAVER—To accept the cession by the States of North Carolina and Tennessee of exclusive jurisdiction over the lands embraced within the Great Smoky Mountains National Park. Reported with an amendment (Report No. 938) by the House Committee on the Public Lands July 14, 1941.

H. R. 3014—HOOK—To accept the cession by the State of Michigan of exclusive jurisdiction over the lands embraced within the Isle Royale National Park. Reported without amendment (Report No. 937) by the House Committee on the Public Lands July 14, 1941.

H. R. 4336—JACKSON—To accept the cession by the State of Washington of exclusive jurisdiction over the lands embraced within the Olympic National Park. Reported with an amendment (Report No. 924) by the House Committee on the Public Lands July 10, 1941.

H. R. 4386—HOOK—To provide for the addition of certain lands to the Isle Royale National Park. Reported without amendment (Report No. 935) by the House Committee on the Public Lands July 14, 1941.

WATER AND STREAM CONTROL

H. R. 4911—WHITTINGTON—Authorizing the construction of certain public works on rivers and harbors for flood control, etc. Passed House June 20, 1941. Passed Senate July 28, 1941. In conference July 29, 1941.

THE AMERICA WE DEFEND

Defense time need for recreation will be the keynote of the twenty-sixth National Recreational Congress when it meets at Baltimore, Maryland, from September 29 to October 3 to discuss "The America We Defend." Highlight of the Congress, it has been announced, will be a conference on the community's responsibility for defense recreation, in which members of local defense committees and public officials will discuss the recreation needs of service men and defense workers.

FEDERAL NEWS AND REVIEWS

AS PART of decentralization of various government departments to relieve congestion in the National Capital, Forest Service regional headquarters for the Eastern Region—Region 7—will be transferred from Washington, D. C., to Upper Darby, Pennsylvania, on November 15, it has been announced. On August 1, the Grazing Service of the Department of the Interior transferred headquarters from Washington to Salt Lake City, Utah, Director Richard H. Rutledge establishing offices in the Walker Bank Building. Thirty-five employees were involved in this move.

Region 7 of the Forest Service is regional headquarters for the Service's forestry work in New England, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia and Kentucky. Regional Forester R. M. Evans is in charge. A total of 128 Forest Service employees will be affected by the transfer.

Big Bend Park Assured

Establishment of Big Bend National Park, which will form the American section of an international "Good Neighbor" park along the Texas-Mexico Border, was assured when Governor W. Lee O'Daniel of Texas recently signed the bill appropriating $1,500,000 for the purchase of the necessary lands on the American side, according to the National Park Service.

Congress on June 20, 1935, authorized the establishment of the American section of the park upon acquisition of these lands. Following this Congressional action, which was based on National Park Service recommendations, a joint commission representing the governments of the United States and Mexico, went into the area and established the boundaries of the proposed international park. The report of this joint commission was one of the early tangible results of President Roosevelt's good neighbor policy toward Latin America.

Now that the United States has cleared the way for establishment of its part of the park it is believed that the Mexican government will proceed to do the same on its side of the border. All conferences between American and Mexican authorities have indicated such action. The Mexican portion will include about 500,000 acres.

The Texas legislature on May 13, 1939, passed legislation authorizing the Texas State Parks Board to acquire by purchase, condemnation, or donation, lands in the proposed national park area not owned by the state and to transfer them to the federal government for park purposes. The appropriation act just signed by Governor O'Daniel will make it possible to carry out that 1939 authorization.

The Big Bend National Park will contain 788,682 acres. Of this the Texas State Parks Board holds title to 112,907 acres, leaving 675,775 to be acquired. These are composed of lands owned by railways and private landholders, grants made to soldiers and settlers, and considerable acreage in the title of Texas public schools.

The Big Bend area is the last great wilderness of Texas, and one of the most extraordinary examples of rugged, unspoiled country in North America. It acquires its name from the fact that it lies in the "Big Bend" of the Rio Grande River where it winds between Brewster County, Texas, and the States of Chihuahua and Coahuila in Mexico. The area of Big Bend will make it the fifth largest national park.

1942 Soil Building Allotments

The United States Department of Agriculture on July 25 announced soil-building allowance rates which will be the basis for determining maximum payments which farmers may earn by carrying out soil-building practices under the 1942 AAA Farm Program. The announced rates are substantially the same as in 1941.

Farmers may earn two types of payments under the Farm Program: (1) a payment for carrying out approved soil-

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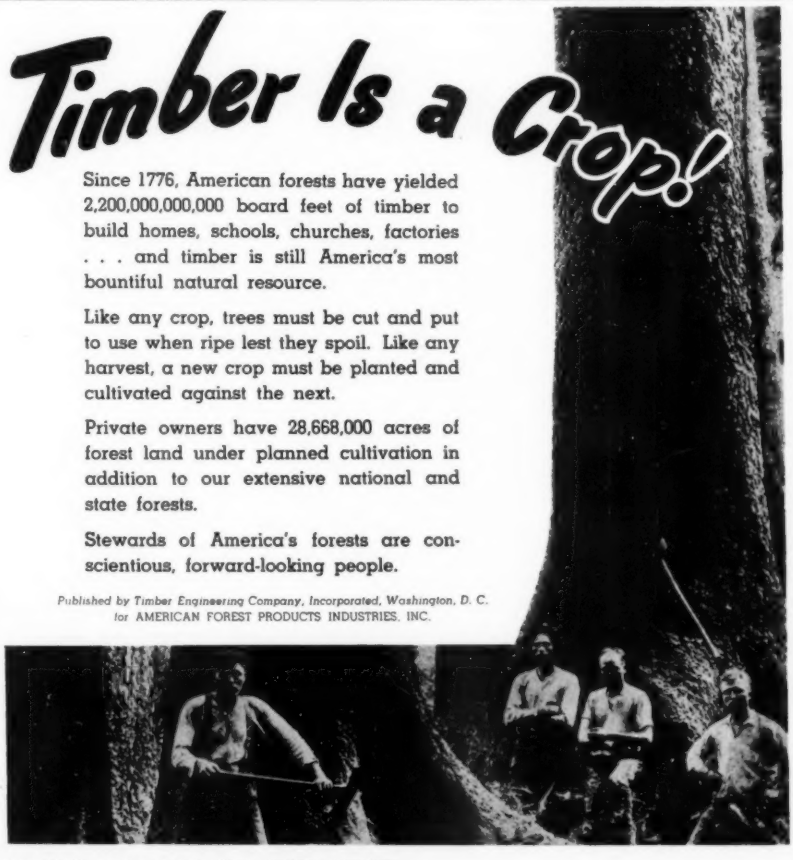
Like any crop, trees must be cut and put to use when ripe lest they spoil. Like any harvest, a new crop must be planted and cultivated against the next.

Private owners have 28,668,000 acres of forest land under planned cultivation in addition to our extensive national and state forests.

Stewards of America's forests are conscientious, forward-looking people.

Published by Timber Engineering Company, Incorporated, Washington, D. C. for AMERICAN FOREST PRODUCTS INDUSTRIES, INC.



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building practices, and (2) a payment for planting within special crop allotments, such as those for corn, wheat, cotton, rice, tobacco, peanuts, and potatoes. Rates for compliance with special crop allotments and other provisions will be announced later. As in former years, conservation payments to be made under the 1942 program are contingent on the annual appropriation authorized by Congress for this purpose in the Agricultural Adjustment Act of 1938. The soil-building rates are being announced now in order that farmers in those states where the 1942 program year began July 1 may plan now to carry out soil-building practices under the new program.

The new program will provide allotments on the same crops as in 1941 except that there will be no allotments for commercial vegetables, and, in lieu of total-soil depleting allotments, there may be substituted special crop allotments covering certain feed grains in surplus areas —oats, barley, rye, grain sorghums, and corn. These crops were formerly included in the total soil depleting allotment for the farm. The feed grain allotment is being provided to stabilize such crops in 1942.

Included in the 1942 program, as in 1941, will be a special allowance of $15 which farmers may earn by planting forest trees. This payment will be in addition to any other allowance which may be computed for the farm. The 1942 program continues the $20 minimum payment which may be earned on any farm. The $20 minimum payment does not include the tree planting allowance.

Paramount to Film "Forest Ranger"

According to the *Washington Office Digest* of the United States Forest Service, Paramount Pictures, Inc., is planning an important technicolor feature motion picture production with the background of forest rangers. The story upon which the picture will be based was written by Thelma Strabel and was published in the September issue of *Cosmopolitan* Magazine as a novelette under the title "Fire By Night." According to Barney Balaban, president of Paramount, the cast for "Forest Ranger," as the picture will be titled, will include Fred MacMurray, Madeleine Carroll, Paulette Goddard and Robert Preston.

Bark Beetle Control

A bark beetle control program that can save millions of board feet of lumber annually has been recommended by Department of Agriculture entomologists and foresters for lumbermen of California's eastside pine region.

Bark beetle infestation and tree damage has been studied on nearly 2,500,000 acres of forest in this area during the past four years. Department specialists estimate that during the last fifteen years, beetles have destroyed more than 11,500,000,000 board feet of timber—more than has been cut for lumber in the ponderosa pine stands.

To combat this destructive insect, entomologists offer a three-way program based on their survey, which includes: (1) early harvesting of timber in badly infested areas; (2) direct beetle control; and (3) sanitation-salvage.

Of the three, sanitation-salvage—which converts infested trees into lumber before they are actually killed and while they still contain their full merchantable value —can be used most generally. This method, however, can be used only in areas where logging and transportation facilities to move logs to the mill at reasonable cost are available or can be readily developed.

Treating trees in direct control does reduce the beetle population and temporarily checks timber losses. But re-infestation is likely. Also treated trees often deteriorate so rapidly after beetle attacks that they lose their merchantable value.

The logging of practically all the timber in an area except a reserve for reproduction, is sometimes effective, but this practice has two disadvantages. Because it is not usually possible in any one year to spread the cutting over more than a small part of the areas attacked by the beetle, losses can continue unabated in the uncut stands. Also, if ponderosa pine were liquidated fast enough to effectively control the beetle, at times when epidemics are in progress, the tremendous production of lumber would quickly demoralize the market, and sustained yield might become impossible.

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FIRE IN THE PACIFIC NORTHWEST

By JOHN B. WOODS

IN A recent article in the local press, State Forester N. S. Rogers declares that the dry grass fire hazard in eastern Oregon is the worst that it has been in any year since 1916, with the possible exception of 1938. Although possibly the worst conditions are found along the Bend-Burns Highway in the vicinity of Silver Lake, there are also extremely bad areas in Baker, Union, Wallowa and Grant counties. In fact, hundreds of miles of open land on each side of the East Side highways present an extraordinary fire hazard. The reason is clear, of course; heavy rains continued until very late in the spring and brought in grass and other vegetation very thickly. Now this has dried out and makes a mass of inflammable material. The Taylor Grazing Service is setting up emergency protection systems along highways within their grazing districts. The Forest Service is organizing flying squadrons, located in the marginal zones around national forests. The state forester has asked the Highway Commission to use its maintenance crews to clean up the worst spots by controlled burning.

The East Side areas in Oregon and Washington have experienced several fires which covered large areas without extensive damage to merchantable timber or young growth. Two or three of the worst of these originated in dry grass areas. In the higher elevations there have been a number of lightning fires; in fact, this lightning situation has been the most troublesome feature with which patrol forces have had to contend during the present season.

In both Washington and Oregon "Keep Green" campaigns have carried the message of care and watchfulness to the people of every community and it is believed that definite, favorable results have been obtained. For example, there has been a marked reduction in the number of man-caused fires in comparison with past years. Stewart H. Holbrook, director of the Keep Washington Green Campaign, reports that for the first time on record, there were no Fourth of July fires in 1941. In Oregon state and private forests, the season up to the end of July had produced 188 man-caused fires as against 332 for the same period in 1940 and 422 in 1939. There were thirty-five smoker fires, as against 102 in 1940 and 101 in 1939. Incendiaries set five fires as compared with fifteen last year and seventy-eight the year before. It is true that conditions during June and most of July were such that fire would not run, but along all of our highways and in most cutover areas, they could have been started by the careless smoker or camper. It is reasonable to suppose, therefore, that at least a part of this better record is due to an awakened public consciousness.

Beginning July 15, and lasting for several days, widely prevalent lightning storms set more than 2,000 fires in the two states and severely taxed the resources of all private, state and federal agencies. The national forests had experienced a better than fifty per cent reduction of man-caused fires, as compared with the last three years. But in lightning storms, which always are a hazard in the higher elevations where the national forests dominate, they now suffered a tremendous increase, 1,431 as compared with 813 for 1940 and 318 for the same period in 1939. Normally, lightning is not a serious hazard in state and private areas of Oregon. But more than 400 fires were set by lightning storms during July. Out of this crisis, there developed a half-dozen or more fires in each state which had serious potentialities. On the areas under Forest Service protection, 23,591 acres were burned over while the state and private forces in Oregon alone lost 8,444 acres.

Washington state and private losses were somewhat greater than this Oregon figure, due to the fact that two large fires, raging in Indian lands of the Olympic Peninsula, swept across intervening state areas. The total area burned over in Washington, exclusive of Forest Service protected areas, is estimated at nearly 30,000 acres, two-thirds of which are covered by the two Indian fires which still resist control.

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Central Forest Fire Torches provide the most efficient and economical method of setting back fires in fighting forest fires. They project an intensely hot yellow flame over which you have absolute control. Burn for either 10 or 20 minutes and equipped with friction cap ignition — no matches required. A sapling can be inserted in the tin ferrule for a long handle, eliminating the necessity of stooping to light each fire. Packed in handy slide-cover wood boxes.

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The Pacific Marine Supply Company, largest manufacturers and distributors of Portable Fire Fighting Equipment and accessories in America, stands ready to do its part in keeping down the annual yearly loss from forest, grass and brush fires. Fire is the great menace to forest preservation and propagation. Foresters, lumbermen, and Government agencies have long recognized Fire as the primary hazard in the timber and pulp industries. Loggers well know that Fire in the timber areas causes a heavy drain on operating profits.

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SCIENCE AND EQUIPMENT

LAND CLEARING BULLDOZERS

The job of clearing land infested with stumps, brush, and so-called weed trees is usually a slow, costly business. How to do the job economically and profitably is a problem that has beset lumbermen, farmers, and conservationists for years. In the State of Washington, where there are thousands of acres of cut-over land, crawler tractors with bulldozers and special toothed land-clearing blades are holding great promise for solving this problem for numerous land owners.

Several years ago operators began to use crawler tractors and bulldozers with regular straight blades, and remarkable reductions in land-clearing costs were immediately obtained. In northern Minnesota they brought about a veritable boom in cut-over land. More than 10,000 people in St. Louis County bought parcels of this type of land in sixty days. Tractors working with bulldozers at around $5 an hour made quick work of clearing the land at incredible speed and almost unbelievably low cost, as one writer expressed it.

The straight blade, however, has its handicaps in land clearing because it mixes too much dirt with the trash, which greatly hinders burning, and, also, more power is required to push the combination of dirt and wood trash. As a result, bulldozer blades were fitted with teeth which could work into and under stumps and lift them up with a minimum amount of dirt clinging to the roots. With such teeth, also, the operators can give the cleared land a last combing or finishing operation and, by continually working the teeth up and down, shake out the dirt and bring roots and small pieces of trash to the windrow for quick burning. Even with such teeth a lot of trouble was encountered. To buck against trees, tough roots, and boulders day after day means a terrific strain on the teeth. At first they were not made big and strong enough.

A special land-clearing blade developed in Washington and Oregon in cooperation with the International Harvester Company has been successfully used.

SPARK ARRESTER

A new tractor spark arrester, designed by Fred W. Funke of the U. S. Forest Service, has shown excellent results in recent tests. Efficiency of the device is approximately ninety-five per cent for small sparks from which the fire hazard is practically nothing, to 100 per cent for larger sparks.

Upon entering the arrester, the carbon particles, because of their inertia, continue in a straight line until deflected by the inverted cone, while the gas turns more or less abruptly, flowing through the holes in the side of the inner cylinder. Having passed the narrow opening between the two cones, the carbon particles fall into a space formed by the outside wall of the frustrum of the cone and the inside wall of the inner cylinder, in the top of which an opening with a removable cover permits cleaning the entrapped carbon from the arrester. The amount of back pressure on the exhaust manifold is only 2.75 inches of water under variable conditions, or less than the back pressure found in the normal exhaust line.

OUTDOOR FIREPLACE

The new "Yard Chef" fireplace will broil, barbecue on spit, roast, toast, bake, fry or boil foods. It includes a roomy oven that can be used for baking or as a warming oven. A solid griddle permits frying without using pans. The fuel pan is perforated on the bottom for better draft, and a wire handle is furnished for raising or lowering the pan for heat control. Beneath this pan is an ash tray which keeps ashes from falling on the ground. Folds compactly for carrying or storing. Burns any solid fuel. The "Yard Chef" retails for approximately $15.00 and is manufactured by the Union Steel Products Company.

"PLASTICHROME" GARDEN TOOLS

To display the beauty and features of its new "Plastichrome" garden tools, the Union Fork & Hoe Company is offering each half-dozen tools in a special display box. Boxes are colored terra cotta and dark blue and lined with black shelves to set off the red plastic handles and bright mirror finish of the blades. The handles are extended toward the user as an invitation to pick up and experience the smooth "feel" of the plastic. The boxes which contain the large trowels and hand spading forks are equipped with two shelves, each containing three tools. A box of narrow transplanting trowels, has all six tools on one shelf. The shelves are designed to hold tools in place both for protection and to maintain neatness.

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SANDVIK BOW SAWS lead in quality and performance, are always dependable and materially assist in reducing operating costs. FRAMES of Seamless Steel Tubing, SAWS made from finest Sandvik Steel, thin back, fast and easy cutting.
Send for Descriptive Folder
Sandvik Saw & Tool Corporation
47 WARREN ST. NEW YORK, N. Y.

Wilderness Trails by Canoe

(*Continued from page* 419)

cabin was nearby and we exchanged visits with the guard and his wife. A lot of the birds left as our laundry appeared on the bushes, scarecrow fashion. Late in the afternoon, Sig Olson, our outfitter, came through going the opposite direction with a party of a father and two sons. They came back upon our invitation to our campfire and obliged with some real entertainment. The main feature was the reciting of that lusty classic "The Hermit of Shark-Tooth Shoal." Dan McGrew was also duly shot, and a new verse added to "Down Under the Hill."

After three portages we were now to enter Basswood Lake, shaped like the letter Z and large enough to have delayed us considerably had we not received another lift from the launches. The long portage around Basswood Falls could utilize some quiet water which made the moving of the canoes easier. Fruit of the shadbush or serviceberry was ripe and sugary on this portage and red raspberries were plentiful. The launch trip took us by the ranger station of Quetico Provincial Park where a camping permit was issued and we spent our only night in Canada at Prairie Portage. Here we camped beside an old splash dam, a remnant of logging days which has established the levels of quite a string of lakes. Its reconstruction by the CCC, under supervision of the Forest Service, is an example of the tasks of minimum development which become necessary in a recaptured wilderness. Boys from the CCC side camp came down Sucker Lake to fish at the dam, rowing a great work barge. On the American side was an Indian homestead where unpainted buildings, half built boats, and battered automobile equipment used in winter hauling over the ice mingled with the killed timber along the shores of Sucker Lake. Such a scene in any wilderness is a shock. What the Forest Service can do to improve this misuse of land will be done, but it will take time.

Seven portages were in store for us on the eighth day's trip to Ima Lake. There was a short paddle through Sucker Lake, a lift-over to Little Iron Lake, down a weed-grown channel to Ensign, through starry white water lilies mingled with the occasional golden globes, the glossy green pads and the tiny yellow flowers with their crimson hearts. A long, lazy pull through Ensign Lake, then portage to Bass—a long one—then another to a small nameless lake, before the pull down the channel between fern covered cliffs to the last carry into Lake Ima. Again we camped on the rocky Minnesota mainland, stopping to examine a gull's nest with one unhatched egg, on a tiny, bleak reef.

Campfire that night disclosed unsuspected talent. Stories of personal adventures, blood-curdling murders and encounters with ghosts, tall hunting and fishing yarns punctuated the usual grist of song and even the loons with their wild, crazy laughter far out on the lake seemed to be participating.

The following morning, we started our course through the next chain of lakes to lovely Lake Insula, where we were due a day of rest. Here we landed on a small sandy beach and made camp on the rocky plateau beyond, overlooking a scene that will last forever. Cool green shores, pushing up their plumes of white pine met our eyes as we looked out past the bronze trunks of the Norways glowing in afternoon sunlight. The inevitable white of the birches as they waved over a distant beach. And back of us the rustle of aspens where a timid doe came with her fawn. Here was peace.

But people get hungry and the fishermen had brought in enough pike for *Kali mojakka,* a sort of mulligan made by the Finnish people of the north and a food for kings and Trail Riders. Vegetables are boiled violently for a good long time in a great pot and into the thin savory soup at the right moment are thrown chunks of fresh fish—great northern pike preferred. This dish is another feature of Lake Insula that won't be forgotten.

With swimming and exploring behind us we got an early start for our last full day in the wilderness. Only if we made camp on Lake One down the Kawishiwi River could some of our party catch their train the next and thirteenth day. There were signs that we'd be bucking headwinds and we had come to believe in signs. But there were only four short portages and two lift-overs ahead and we had a hundred miles of paddling behind us. We passed more people this twelfth day. Several parties waved from shore. Boats with outboard motors passed occasionally. At noon we met a guide and party starting into the wilds and compared with our bronzed appearance, looking strangely pallid. The pull across Lake One, a part of the chain that forms the Kawishiwi River, was real excitement. The wind had come up in earnest, white-caps rolled around us, now and then the eighteen-footers would ship water over the bow. Water was too low to take one of the short cuts we had planned and we were glad when Johnny the cook came round a point with the big square stern canoe to relieve us of some of the duffel. And Big Dave's advice was good "In de stern, turn de paddle always out; den you don't lose power and dey don't yerk!"

There had been no time for fishing on the ten mile paddle and we were back on canned beef which, strangely enough, yielded perfectly to the disappearing magic.

Our last campfire lighted the dark waters of Lake One. Tomorrow we should paddle an orderly and brief approach to Fernberg Landing. There was talk of back country in Maine, in Florida, in the West, but from the silent wilderness behind us came the cry of the loon, and each of us knew that the wild, still North holds peace and strength and high adventure and that it calls and calls again.

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Forestry Without Public Regulation

(*Continued from page* 429)

are marked by the forester and his assistants. Camps are located with due consideration to obtaining the maximum number of cords, and cutting plans are made a year in advance. During the cutting of the pulpwood the area is sub-divided into small lots containing 300 to 1,000 cords, some of which are then sublet to individual jobbers, and others are cut by the company under the direction of the camp foreman. The camp foreman has control over the operation under his charge.

The annual cut averages 35,000 cords divided roughly among seven camps, each getting about 5,000 cords, of which spruce comprises eighty per cent and fir twenty per cent. The cut of pulpwood corresponds approximately to the annual growth as determined by the study in 1923. According to Mr. Ostrander the company's holdings have supplied nearly all the pulpwood required by its mill.

The company fells and peels the pulpwood in the spring and early summer; skids and bucks it up into four-foot lengths and then hauls it to the streams in the winter. The river drive is fortunately short in duration, so that the wood reaches the mill usually within sixty days after traveling a distance of about 100 miles. All the timberlands with small exceptions are on the Hudson River drainage and hence tributary to the mill at Glenns Falls. Loss by driving has been less than one per cent.

Many studies have been made by the company's forestry department. Notable among them is the experimental girdling of hardwoods—that is, of beech, yellow birch, and maple—to release the small spruces and balsam firs suppressed by large hardwood crowns. This girdling is confined to land which is primarily adapted to the growing of spruce and fir and to defective and unmerchantable hardwood trees whose death will directly benefit the growth of the softwoods underneath.

Some years ago the company gave to Cornell University a tract of approximately 640 acres near Newcomb, as a study ground for the forestry department during the years of professional training in forestry. This area constitutes the "Finch, Pruyn Experimental Forest," which is the focus of research work by the Northeastern Forest Experiment Station of the Service in the Adirondacks.

It should be a great encouragement to timberland owners everywhere to find a company not only successfully practicing forestry but doing so with marked financial success. It would have been fortunate if this good example had been more widely followed by those timberland owners who were able to do so. Had this been done, private ownership might not now be threatened with public regulation which, no matter how meritorious in other respects, is generally regarded as an invasion of private property rights and as another lamentable instance of the now all too frequent destruction of long acknowledged constitutional privileges.

Dr. Oberholser, Famous Ornithologist, Retires

DR. HARRY C. OBERHOLSER, internationally known ornithologist, retired from government service on July 1 after forty-six years of duty. The 71-year-old scientist was to have been retired last year from the Fish and Wildlife Service of the Department of the Interior, in accordance with Civil Service regulations, but President Roosevelt signed an order extending his appointment for one year to give him time to finish a three-volume work on the birds of Texas.

A leading technical ornithologist in America, Dr. Oberholser was one of the first scientists to take part in the federal government's large-scale studies on the migration habits and distribution of North American birds. In 1920 he organized the federal government's bird-banding work, and he later directed the first nation-wide migratory waterfowl inventories.

Author of some 800 technical and popular publications on birds, he has been the first to describe and give scientific names to 650 bird forms. Other ornithologists have named several birds in his honor, including a genus of greentailed towhees called *Oberholseria,* a species of flycatchers named *Empidonax oberholseri,* a subspecies of thrashers called *Toxostoma curvirostre oberholseri,* and others.

During his years in government service, Dr. Oberholser became known in legal circles for his ability to identify species of wild birds by examining their bones or feathers. He was frequently called into federal and state courts as an expert witness in cases involving wild duck bootleggers and sellers of other migratory birds.

Dr. Oberholser is also well known as an educator and lecturer. He was Professor of Zoology at the Biltmore Forest School, North Carolina, summer sessions from 1904 to 1910, and was Professor of Zoology of the American University graduate school in Washington, D. C., from 1920 to 1935.

Outstanding among his publications is "The Birds of Louisiana," a large volume describing all species of birds found in that state. "Birds of Texas," a 3-volume work he has recently completed in manuscript form, describes in detail the 824 forms of birds found in the Lone Star State. These represent about three-fourths of the kinds of birds found in the United States.

Dr. Oberholser was born in Brooklyn, New York, on June 25, 1870. He attended elementary schools in Brooklyn and the Pratt Preparatory School in Shelburne Falls, Massachusetts. In 1895 he went to Washington, D. C., and later enrolled at the George Washington University, where he obtained his A.B. and M.S. degrees in 1914, and Ph.D. degree in 1916.

Dr. Oberholser joined the federal service on February 1, 1895, when he received an appointment in the Division of Ornithology and Mammalogy, of the Department of Agriculture.

Jimmie Herron, of Kelso, Washington, is still world's champion log-roller and block-turner, successfully defending his title as King of the White Waters at the annual Roleo held at Gladstone, Michigan, under the auspices of the National Roleo Association. He defeated Elmer Swanson, lumberjack champion from the State of Washington, after eleven minutes of furious birling. Here the champion is shown "walking the keg" seventy-seven times in two minutes for another world's title. The "keg" is a solid fir block, thirty-one inches in diameter and seventy-two inches long

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YOUR SHADE TREES:

By J. J. LEVISON, M. F.
Consulting Landscape Forester

SOME POPULAR FALLACIES

MOST PEOPLE have false notions about the care and planting of trees. One common notion is that when a tree shows a decaying wound or cavity, the only thing to do is to fill it with some solid substance like concrete, cork or some other ingredient. Many of us have spent large sums of money on filling cavities in old decrepit trees permeated with fungus threads that could never be eliminated. Later on when the interior of the cavity became exposed, it was found that the wood rotted away in spite of the filling. We became disillusioned about cavity filling and henceforth discredited everything connected with that phase of tree work.

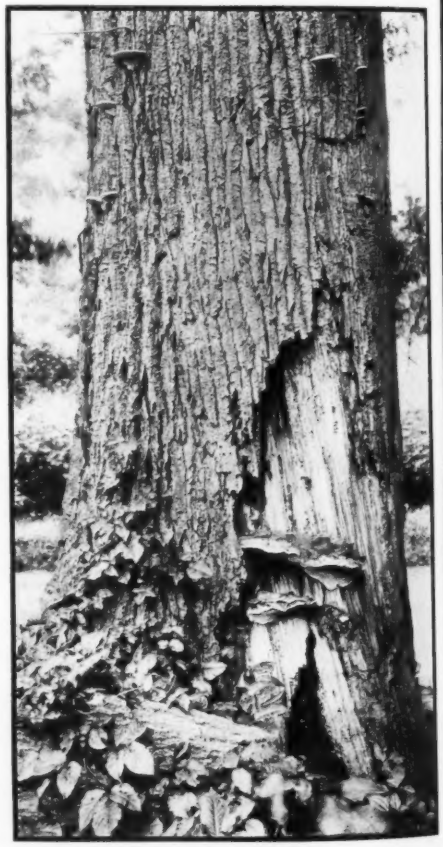
The layman who thinks that cleaning out and filling the cavity is all that is necessary to arrest decay, is mistaken. As a rule, when the cavity is already formed, decay has permeated the interior of the trunk or branch and the fibres radiating from the fungus being microscopic, some of them may be left behind. When the cavity is filled, the remaining fibres or hyphae of the fungus find ideal conditions for further growth within the tree because all fungi or disease require darkness, warmth and moisture and these are the very conditions created by the filling. After a few years, the owner finds that the fungus has permeated the whole body of the tree or limb and that the tree is either dying or so badly decayed that it is no longer safe or worth keeping. If originally, the cavity had been thoroughly freed from decayed wood, chiseled out in a manner so as to drain properly and if the wound had been thoroughly disinfected with creosote and coal tar and left open the progress of further decay in later years would have been obvious and additional measures could have been taken to arrest decay. Furthermore the work would have been cheaper and more under control.

Of course, there are exceptions to this and there may be instances where the cavity is small and free from disease and where a filling would serve to keep out moisture and to furnish a suitable surface for the living tissue or cambium to roll over. In such cases, the filling of a cavity is justified. Most men in the field today who go in for tree repair know better and will not stoop to do work that has no scientific justification. Yet there are others who stress cavity filling unduly with the result that the filling of cavities as practiced today is overdone and its importance much over-estimated.

In the matter of insect control we have similar fallacies. How often have we been frightened by some expert or all-knowing neighbor about the injurious effects of the white pine louse which frequently covers the bark of the white pine? It looks badly but I have never seen it kill a tree. Have we not been concerned about the oak twig pruner, an insect which prematurely clips off the twigs of the oaks? It has never been a serious pest and if it does not get any worse, it might even be looked upon as doing some good because it makes the crown of the tree more compact and consequently more resistant to excessive evaporation. Very often we are annoyed because we find a few holes in the leaves chewed out by some caterpillar or beetle. If the defoliation is not severe and not continuous over a period of years, there is hardly any permanent damage to the tree and our anxiety is unfounded.

People will get all excited about the spraying for leaf-eating caterpillars and beetles but will overlook entirely the importance of spraying for sucking insects during the winter or early spring. These insects such as the oyster shell scale, the San José scale, the scurfy scale, the European elm scale and numerous other sap-sucking pests are more prolific and damaging to their hosts than are the caterpillars. Yet people feel that they are not

A dangerous tree, with a deep, old wound which could have been saved if treated



It would be unwise to fill this tree, as fungus has permeated the whole body

as important as the caterpillars because their work is insidious and less flagrant.

A more amusing example of how often people do things just because they see others do them without finding out the underlying causes can be seen in the common practice of putting bands around the trunks of elm trees to prevent injury from the elm leaf beetle, our most common leaf eating insect of the elm. A peep into the life-history of this insect will reveal the fallacy of this practice. The elm leaf beetle passes the winter as a mature beetle, hiding itself in attics and wherever it can secure shelter. In May the beetles emerge from their winter quarters and fly to the leaves. The *bands* on the tree can therefore be no impediment to the flying beetle.

While these beetles are chewing the leaves, the females deposit bright yellow eggs. These eggs soon hatch into small grubs which eat away the soft portion of the leaves causing them to appear like lace work. The grubs become full grown in twenty days, crawl down to the base of the tree and there transform into naked orange-colored pupae. These pupae can be seen lying in heaps at the base of the elm tree in August. They lie that way, dormant, for a week and then change into beetles again. One can easily destroy them while they are in the pupa state at the base of the tree. But here again, what good is the band on the trunk when the grubs are trying to come down from the crown to the base of the tree to change into pupae?

The only justification for a band on a tree is when it is intended against crawling caterpillars like those of the gypsy month, or against the wingless female moths of the fall canker worm which have the habit of crawling up the tree to deposit their eggs. With such crawling caterpillars, the bands act as a barrier and force them to deposit their eggs below the band.

The premature death of thousands of hickory trees in the east from the hickory bark borer, is another example of popular fallacy due to lack of knowledge. Most people discover that their hickories are dead during the summer and cut them down at their convenience. If the owner will examine his tree in September, he will find that the leaves of infested hickories suddenly turn black and become so conspicuous that an infested tree can be easily distinguished from all others at a distance. If these branches or the whole tree when hopelessly infested, are removed and destroyed before the mature borers emerge in June, the remaining part of the tree or the adjoining trees can be saved; otherwise, the beetles will emerge in June, multiply and reinfest the neighboring trees. Most people wait to destroy the infested trees or branches when the beetles are out and wonder why they continue to have dying hickories every year in increasing numbers.

Erroneous ideas are also frequent in the matter of pruning trees. Very often we find that owners are advised to prune or thin out their shade trees in the same way as they would thin their apple trees. The thinning of apple trees may be justified because there, the ultimate object is to permit a maximum quantity of light to permeate the whole crown of the tree in order to develop the best fruit. But in the case of shade and ornamental trees, the ultimate object is to develop a thick, healthy mass of foliage and this can only be done by cutting back the twigs and branches, a process which will develop a dense mass of foliage that will shut out the sun and wind from the interior of the crown and thereby conserve as much moisture in the leaves and stem as possible.

There is a great distinction between thinning out a tree and cutting it back. Thinning out the crown means the entire removal of twigs and branches and exposing the leaves and stems to the drying effects of sun and wind with the result that more moisture is evaporated than if the crown were kept compact and dense. Cutting back means leaving every branch and twig intact but merely shortening them in order to encourage the growth of additional twigs and branches. Except where I want to encourage the development of fruit, I prefer to clip trees back occasionally in order to thicken up the foliage and thereby make the trees more resistant to excessive evaporation.

When it comes to the removal of dead branches, most owners make the mistake of waiting until the dead branches are decayed and ready to fall off. In such cases, the decayed branch leaves a cavity behind, whereas, if the dead branch were removed immediately after it died and the resulting wounds dressed with coal tar, the cavity could have been prevented.

In feeding trees, we also very often lose sight of the fundamental requirements and fall a prey to some suggestion of a sensational stimulant. In most cases where trees look impoverished, they lack moisture and soil rich in vegetable matter capable of absorbing and holding moisture for the tree roots to take up when the tree needs it most during the dry season. This is the way nature takes care of trees in the forest where the trees seem to thrive better without man's interference. What really happens in the forest is this. The moisture in the ground around the roots of the tree is conserved by a mass of vegetable mold and semi-decomposed leaves in mixture with the soil. This composition is known as humus.

Now if we would just apply this lesson to our trees growing under artificial conditions in the open, in poor soil and in sandy soil we would come to the conclusion that we must feed them with something that will retain moisture rather than merely stimulate them chemically.

I do not want to leave the impression that artificial fertilizers are not useful in stimulating well-established trees where stimulation is wanted. I, myself, have often used such fertilizers as acid phosphate, muriate of potash and nitrate of soda, in proper proportions with good results. What I do want to point out is that in most cases a thorough application of the old-fashioned compost consisting of decayed leaves, old manure and a little good garden soil thoroughly worked in among the roots is the best way to feed a tree.

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and

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This manual has been prepared in order that the residents and visitors of the National Capital may have, in convenient form for ready reference or as a guide for "tree hunting," simple but accurate descriptions of the more common trees growing in the woods of the District, along its streets, and in its parks. Most of the trees described are native, while some have been introduced from other States or countries.

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Haiti to Plant Rubber for U. S.

THE Republic of Haiti is expected in the future to supply a part of United States rubber requirements, the Department of Agriculture says in an article appearing in *Agriculture in the Americas* for July.

Although Haiti grows no commercial rubber now, an eventual planting of 70,000 acres of high-producing Hevea (rubber) trees is planned, Thomas A. Fennell, agricultural advisor to the Haitian Government, writes. The immediate objective is to establish rubber plantations totaling 7,500 acres, he says.

The production of rubber, Mr. Fennell adds, has been made the chief objective of the United States-Haitian agricultural expansion agreement announced May 6 by the Department of State. In an introduction to the article, President Elie Lescot of Haiti terms the agreement "one of the most far-reaching economic steps in our national history" and cites it as an example of "democracy in action."

The Haitian agreement is the latest step in the Department of Agriculture project to reduce United States dependence on rubber sources outside the Western Hemisphere. Since August, 1940, Bureau of Plant Industry survey parties have inspected potential rubber-producing areas in fifteen Latin American Republics, of which Haiti is the smallest. Several experiment stations and nurseries have been established, among them one at Marfranc, Haiti, which is the source of the high-producing rubber trees for the Haitian program.

The Haitian plan also calls for immediate establishment in Haiti of banana plantations totaling 6,500 acres, and for increased production of cacao, oils, spices, fibers, and other tropical crops. It is also proposed to develop small Haitian-owned craft industries. United States capital and technical assistance will help make the expansion possible.

"The supervising agency for the new program," says Mr. Fennell, "will be a government-owned corporation . . . authorized to carry out in every way a large business whose purpose is to foster agricultural and crafts enterprises in Haiti. It may grow, process and buy and sell for local and export markets all types of agricultural products, except that it will not buy nor export bananas."

Wanted—A New Concept of Forest Protection

(*Continued from page* 415)

report on insect outbreaks in their early stages. As is the case with fire, it is in these early stages that insect outbreaks can most effectively be controlled. Several states and the Dominion of Canada already have such organizations. Maine started a similar plan nearly seventeen years ago and large quantities of timber have been saved as a result.

Such a plan calls for constant supervision and frequent visits by the entomologists with the forest wardens in the field to show them at first hand what to look for. Group meetings with talks on forest insect detection and control are highly desirable. Cooperation of land owners and their representatives in the field is not only essential, but from a public relation standpoint, highly desirable. Yearly forest insect surveys of large holdings might well be the means of saving thousands of dollars if carried out by trained entomologists.

There has been some tendency to unload onto the federal government detection and control work on state lands. This is wrong, for the closer the entomologist can get to timberland owners, to state fire protection organizations, and to the actual areas involved, the more effective insect control work will be. In a similar way, entomologists and pathologists should be attached to federal forest holding departments.

The Bureau of Entomology and Bureau of Plant Industry now have regional stations where forest insect and disease control studies are carried on. These stations are of utmost importance in that control work must be based to a large extent on the results of their work. Where parasites are to be imported to fight forest insects the Bureau of Entomology is best fitted, through its foreign agents, to collect and raise them. The federal bureaus, with their extensive insect and pathological collections, are the logical sources for information on the identification of unusual species, and the importance of this phase of their work cannot be over-emphasized.

It is almost invariably true that wasteful methods of logging are followed by destructive insect damage. Once an outbreak is started there are several avenues of attack based on the value, accessibility and type of forest, and on the species of insect or disease involved. It may be that the outbreak can be controlled by judicial cutting much as a surgeon removes diseased tissue, or it may be that the introduction of parasites, which normally prey upon the insect, will prove the best means of attack.

To summarize what has been said, the present situation, involving as it does, losses from forest insects in excess of those from forest fire, dictates that forest protection should be organized to include protection from fire, insects, and disease; that all species of trees should be regarded as potential sources of wealth; that regional advisory committees on forest protection should be set up; that compulsory courses in forest entomology and forest pathology should be given at forest schools; that entomologists should be connected with each state and federal agency whose duties are to protect our forests; that our present warden force should be used to report on insect and disease outbreaks as well as fire; and that stronger support should be given state and federal agencies engaged in insect and disease control.

Tree Artistry

(*Continued from page* 412)

course,—then they caught hold of an overhanging tree just before being swept over Munsungan Falls, and managed to swing themselves in to the shore.

It was during this sort of life that Ronald Locke was learning about trees. While he was living among them, he was observing from the viewpoint of a draftsman the structure of their branches, their foliage and bark, and intricate patterns characteristic of each species. With equal care he observed a setting, whether it happened to be the yard of a Floridian net mender or a New England "sugar camp."

In spite of certain philosophic titles to his etchings, trees are his one interest. "Contentment," "Against the Wind," "A Day to Be Remembered," "Peace on the Amelote" are all splendid tree portrayals, and his titles convey in each case the mood that particular tree casts upon him. Other titles are descriptive. In "Changing Weather" he depicts coconut palms and cabbage palmettos blown by a breeze off the Gulf. In "End of Sugaring" he is interested in the rugged trunks of sugar maples. Other titles indicate the tree under consideration. "Glorious Eucalyptus," "Hickory Tree," "Pine Branches" and "The Old Mulberry Tree" need no explanation, but are none the less enticing in print form.

Locke etchings have been acquired for many distinctive collections. A few of these are the Honolulu Academy of Fine Arts, Yale University, the Valentine Museum in Richmond, the Iowa State College, Cornell University, Syracuse University, the William Rockwell Nelson Gallery of Art, the Robert Hull Fleming Museum and many other galleries.

If War Comes to the Forests

(*Continued from page* 434)

by a trained registrar to question each person as to why he wishes to enter the forest, where he is going, how long he is going to stay, his name, address, car license number, occupation and other information, this system could be used to make the work of "fire bugs" exceedingly dangerous and difficult. During the time the visitor was in the forest he would be more or less under the sharp eyes of the forest patrolmen and law enforcement officers—whose force would have to be increased for this work. Then when the visitor was ready to leave the forest he would have to check out. If an incendiary fire had been set and a man managed to sneak out of the forest he would be a suspect. Such an extensive forest checking and patrol system would make the crime of incendiarism as difficult to escape as murder.

The question may naturally be asked, as to incendiary forest fires during the World War of 1917 and 1918. The answer for the California region is vague on the point of sabotage fires. The State Forester in his report for these years says "The 1918 (fire) losses are shown as four times greater than those for 1917. This increase was due in part to the exceedingly long dry period, which greatly increased the fire hazards, and in part to the activities of the incendiary. This was a carefully executed scheme to destroy a vast amount of valuable property." Part of these fires were directed against the forests and part were set in the grain and hay fields.

During the 1916-18 period the State Forester's office helped the County Farm Bureaus, Stockmen's Association and County Councils of Defense to organize and set in motion some four hundred rural fire companies to help control the increased fires. These rural fire companies were in nearly every county of California.

Our participation in World War Number One was an offensive action in Europe. We fought on other nations' soil. But our foreign policy now is not to fight actually anywhere except in this hemisphere. To use our defenses to fight a defensive war is to prevent the enemy or coalition of enemies from invading this continent. If we are forced into this present war and maintain our present policy it means that the war will be here, on our own land. The enemy will be striking at our coasts and our boundaries. In this respect World War Number One cannot be a guide as to what we may expect if we enter this war.

That is why we cannot afford to overlook the threat to our tremendously important resources. But if the American people do not show more concern over the threat of war to the forests than they do over their own carelessly started forest fires, then nothing will be done towards forest defense.

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Index to

ADVERTISERS

September, 1941

American Telephone and Telegraph Company ... 2nd Cover
Ashley Automatic Wood Stove Company ... 438
Atkins & Company, E. C. ... 447

Bartlett Manufacturing Company ... 440
Beebe Brothers, Inc. ... 447
Brooks Equipment and Manufacturing Company ... 438

Caterpillar Tractor Company ... 403
Central Railway Signal Company, Inc ... 439
Cleveland Tractor Company 3rd Cover

Fechheimer Brothers Company 440

Hemingway Tree Farms ... 445
Herbst Brothers ... 445

Ingersoll Steel and Disc Division ... 441

Keene Forestry Associates ... 445

Loring, J. Alden ... 440

Mears, A. H. G. ... 440

Pacific Marine Supply Company ... 439

Randolph, L. F. ... 447
Remington Arms Company ... 443

Sandvik Saw and Tool Corporation ... 440
Smith & Company, D. B. 4th Cover
Stetson Company, John B. ... 437

Timber Engineering Company 437
Tobacco By-Products & Chemical Corporation ... 445

Western Maine Forest Nursery 445
Weyerhaeuser Company ... 435

In 1939, an average fire year, there were 212,671 forest fires in the United States. There was a carelessly started or intentionally set forest fire every two and one-half minutes. Forest trees sufficient to build 330,000 six-room homes were burned.

Opening the 1941 fire season, and an example of the threat we face, were the 5,308 eastern fires during the last part of April—many of them incendiary. Damage of almost two million dollars to the forests and woodlands of twelve states and of between three and four million dollars to villages, farms, livestock, churches, power and telephone lines were the toll taken in the 268,000 acres swept by the fires. The services of 50,000 fire fighters were required finally to control the flames. Then they succeeded principally because it rained. But we cannot hope for rain on the Pacific Slope during our fire season.

There are many people, of course, who will say that this warning to prepare our forest defense is unnecessary, that we are in no danger of attack anyway. However, most of us will prefer to look at the events of the last few years and to believe the heads of our government who tell us differently and who are informed by the best of informed experts.

We all know that a powder plant which requires a year to build and put in operation can be sabotaged and blown up in a few seconds. And a forest which has required a hundred years to grow, with all its kindred resources, can be burned in a few hours.

Canada's Fight for the Musk Oxen

(*Continued from page* 425)

"In Greenland, as everywhere else in the Arctic, musk oxen constitute the great emergency supply of food in hard times, which are always liable to occur in these latitudes. Accordingly the hunting of musk oxen is everywhere strictly regulated, and in Greenland the Eskimos never transgress the prohibition against killing these beasts, for they recognize how wise this prohibition is. At Scoresby Sound, and in the districts to which colonization there will eventually extend, the preservation of the musk oxen is particularly important. The trailing land in this region is really the economic hinterland of settlements there. It is precisely this region which constitutes the Norwegians' hunting-ground. The herds, moreover, follow the coast, and to destroy them in one place means threatening the whole country with famine. In 1931, the Norwegian hunters at Mackenzie Bay killed 130 musk oxen, most of them to feed their dogs. One of their firms offered a score of musk calves to European zoological gardens, where the calves could not survive. Their capture, according to Dr. Charcot, would mean the massacre of 100 adult animals, for when a herd is attacked they form a square with their young in the middle, and let themselves be killed to the last in order to defend them."

How many musk oxen are now left? Captain Ejnar Mikkelsen, who has explored most of the Greenland coast, estimates there are about 11,000 left in Greenland. In the Canadian government's report on the conservation of its musk oxen it is stated Melville Island has about 4,000. Ellesmere Island has an equal number, and every year a party of Greenland Eskimos cross and kill a limited number, but Professor D. MacMillan, who knows this part of the north as well as any man, thinks this will not cause any serious depletion. Other herds are: Axel Heiberg Island, 1,000; Devon Island, 200; Bathurst and Prince of Wales Islands, 1,500 each; Cornwallis Island, 200; and Banks Island, about a score. It is possible these figures are too large, as they were reported ten years back. In various spots of the Canadian Arctic there are another 250 or so. This does not include the Thelon Game Sanctuary, where there were 250, and because of strict protection this number is increasing.

The action of the Canadian government is in striking contrast to what has been permitted in Greenland. Alarmed by the stories of ruthless killing in 1917, it passed a regulation making trade or traffic in musk ox hides illegal. The restriction applies to white men and native alike and is rigidly enforced by the Royal Canadian Mounted Police. After the regulation was passed no one was permitted to hunt or molest the musk oxen except in case of dire need to prevent starvation. The natives, unable to get rid of the hides, no longer had any incentive to make the long, hard journey to musk ox territory. A few years later some of the Arctic islands were set aside as a native game reserve.

After the World War rising prices led to a mad scramble for fur, and white and native trappers pushed their lines even into the remote musk ox habitats. It was almost impossible to get supplies from the trade routes and so advantage was taken of the "to prevent starvation" clause and the musk oxen suffered accordingly. To stop this the regulation was changed to make it an offense to kill musk oxen under any circumstance. The most important link in the chain of musk oxen protection was forged by an Order in Council, dated June 15, 1927, when 15,000 square miles along the Thelon and Hanbury rivers became the Thelon Game Sanctuary for the protection of the known remaining herds of musk oxen on the Canadian mainland.

This step was the fulfillment of the recommendation of the Royal Commission's Report of 1922 upon the possibilities of the reindeer and musk ox industries in the Arctic and sub-Arctic regions. The members of the Commission "strongly recommended" that all possible steps should be taken to safeguard and preserve such musk oxen as still remained on the Canadian mainland. They regarded very highly the contribution musk oxen could make to the economic life of the north.

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